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FOUNDED BY DR. MAX THOREK

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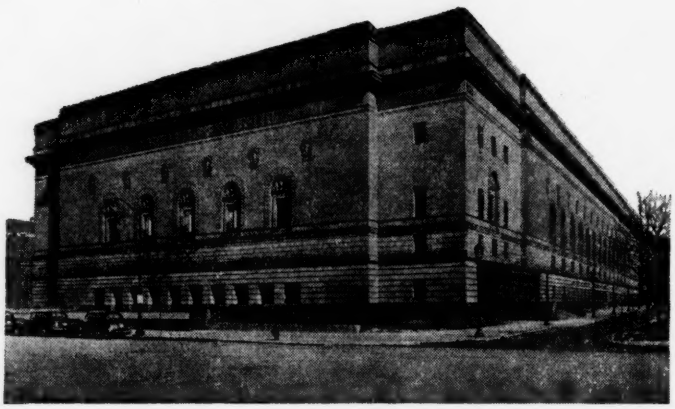

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Original Articles

Lumbar Hernia

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CHICAGO

LUMBAR hernia is variously known as hernia dorsalis; Petit's hernia; Grynfeltt's hernia; costoiliac hernia of Larrey, and suprailiac hernia of Huguier. The areas in which it may occur are known as the Grynfeltt-Lesshaft space; the lumbocostoabdominal triangle of Grynfeltt; the spatium tendineum lumbale of Baracz; the rhombus of Lesshaft, and Krause's tetragonum lumbale.

A lumbar hernia may occur anywhere in the lumbar region, which is bounded above by the twelfth rib, below by the crest of the ilium, in front by a line drawn vertically downward from the anterior extremity of the twelfth rib to the crest of the ilium, and behind by the vertebral column and the erector spinae muscles.

There are two types of lumbar hernia: (*a*) congenital and (*b*) acquired. The acquired type may be (*a*) spontaneous or (*b*) traumatic.

The recorded history of lumbar hernia as a clinical entity begins in the seventeenth century. The "Treaty of Hernias" (Franco, 1561) dealt exclusively with inguinal hernias; ventral hernias of any kind were not considered. It was not until the middle of the next century that authentic data became available. From that time on the history of this condition falls into two main periods.

In the earlier period, lumbar hernia was first suggested as a possibility by the French physicians Barbette (1672) and De Lagarenne (1726). These authors, however, had no clinical experience to report. Blancard (1701) and Dolee (1703) also considered the probable occurrence of such a condition, but their suggestions were less definite than those of Barbette and De Lagarenne, and they also made no clinical contributions. Budgen in 1728 described a case of what was apparently congenital lumbar hernia, but did not diagnose it as such. The first authentic case report was made by De Garengeot in 1731. His patient, a woman, died; at autopsy a tumor "the size of a nut" was found in the right lumbar region. It proved to be reducible, confirming the diagnosis of hernia.

Petit, in 1733, was the first to describe the course and point of exit of lumbar hernia, and his name was given to both the hernia (Petit's hernia) and to the area of its occurrence (triangle of Petit). His description was fuller and clearer than any other then available.

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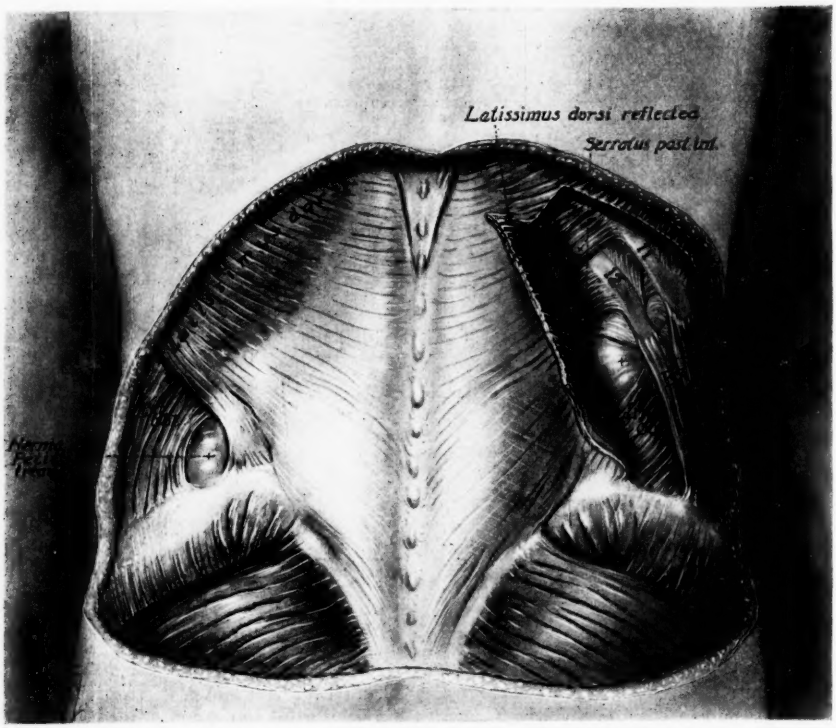

Fig. 1.—The anatomic background of lumbar hernia. Petit's triangle and the superior lumbar triangle are shown in relation to the surrounding structures. (From Watson, L. F., *Hernia*, C. V. Mosby, St. Louis.)

The area in which he located the hernia was the inferior lumbar triangle.

In 1750 Ravaton published the first report of a strangulated lumbar hernia with operation and recovery. His patient, a pregnant woman, had a normal delivery. In 1767 Heuermann reported a case of strangulated hernia with spontaneous cure through formation of an artificial anus. In the following year Balin described a lumbar hernia the point of exit of which was above the ilium and behind the external oblique muscle.

Of these earliest authorities, Petit, by the care and accuracy of his observations, achieved a precedence which has been widely questioned. Larrey cited the writings of Barbette to demonstrate the latter's priority (Macready, *Lancet* 1890), and Jeannel disputed the designation of the inferior lumbar trigonum by Petit's name, pointing out that Dolee, De Garengeot, Ravaton and Balin have an equal claim. Petit himself disclaimed originality.

Various further contributions to the literature on lumbar hernia (see table) were made by Decaisne (1838), Verdier (1840), Colles (1857), Nélaton, (1858-59), Chaplain (1861), Marmisse (1862), Schraube (1863) and Kingdon (1864).

The second period may be said to begin with Grynfeltt, who in 1866 described hernia of the superior lumbar triangle as distinguished from the inferior lumbar triangle of Petit. This area became known as the lumbocostoabdominal triangle of Grynfeltt. Larrey, in 1869, referred to the condition as costoiliac hernia. In 1870 Lesshaft confirmed Grynfeltt's observations, calling the Grynfeltt area the "superior lumbar trigonum" or "rhombus lumbalis."

Rigyon in 1872 reported 2 cases. In 1879

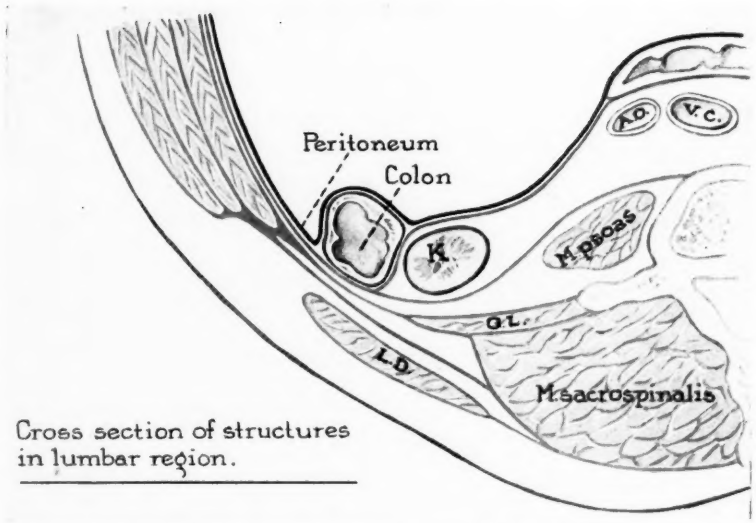

Fig. 2.—Artist's diagrammatic representation of cross section of structures concerned in lumbar hernia. (Thorek, Max: *Modern Surgical Technic*, Lippincott 1950.)

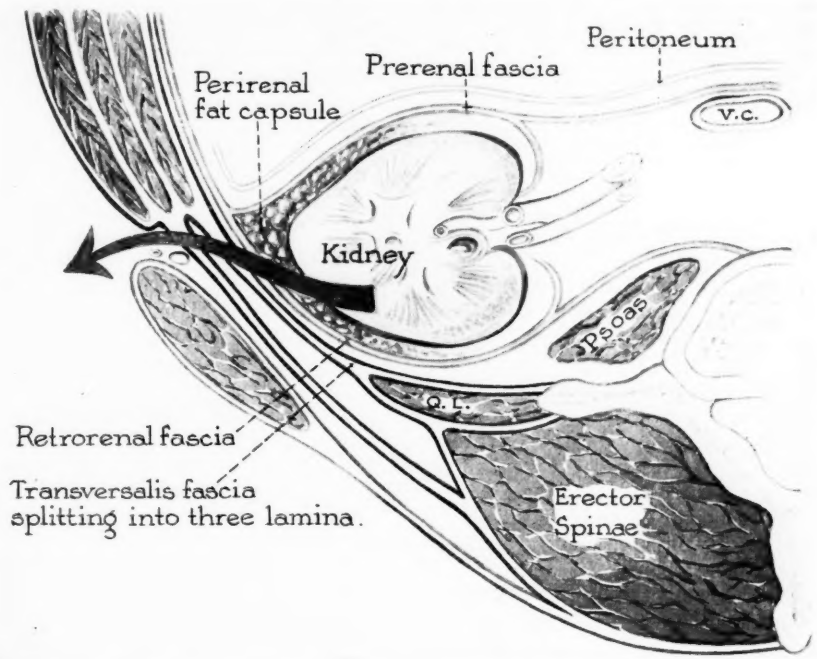

Fig. 3.—Lumbar hernia, showing the route of a herniated kidney. (Thorek, Max: *Modern Surgical Technic*, Lippincott 1950.)

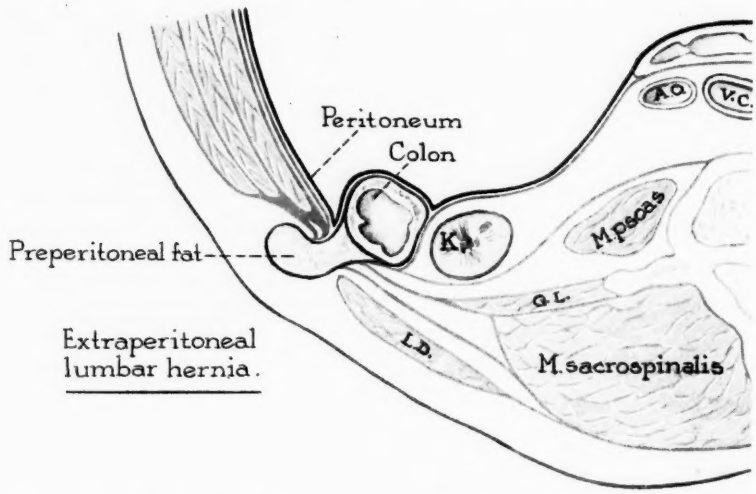

Fig. 4.—Structures concerned in extraperitoneal lumbar hernia. Thorek, Max: *Modern Surgical Technic*, Lippincott 1950.)

Braun, in a paper entitled "Die hernia lumbalis," expressed doubt as to the actual occurrence of hernia in the Grynfeltt-Lesshaft trigonum, as did Wolff in 1880. In 1882 Romanescu made a study of the etiology, symptomatology and diagnosis of lumbar hernia, and some years later (1890) Macready collected reports of 25 cases. Further contributions were made by Owen (1888, first case in which radical operation was employed); Wyss (1892); Berger (1895); Borchardt (1901); Webb Jones (1902); Fuld (1902); Baracz (1902); Campora (1905); Ruppanner (1908); Goebel (1920), and Serafini (1920). In 1923 Watson collected 132 cases from the literature (sex of patients, predominantly male; chief complication, strangulation). In 1925 Virgilio collected 109 cases and expressed the opinion now generally accepted, that the Grynfeltt-Lesshaft triangle is a far more frequent site of lumbar hernia than is Petit's triangle.

The inferior lumbar triangle (Petit's triangle) varies greatly in size, being in some instances little more than a slit and in other instances entirely absent. When present, it extends forward to the external oblique muscle, backward to the anterior border of the latissimus dorsi and downward to the crest of the ilium.

The superior lumbar triangle (Grynfeltt-Lesshaft space) is somewhat larger and is also more constant. It is found at a somewhat higher level. Its upper boundaries are the twelfth rib and the lower border of the serratus posticus inferior muscle; it extends forward to the posterior border of the internal oblique and backward to the anterior border of the erector spinae muscle. It is only roughly described as a triangle, as its shape varies considerably in different subjects.

The points of weakness through which abdominal contents may escape are as follows: through either of the aforesaid spaces; through irregular openings in the muscles and aponeuroses; through slits or buttonhole openings resulting from trauma or maldevelopment (Morestin); or through the apertures for the cutaneous branches of the second and third pairs of posterior lumbar nerves (Braun). To these weak points may be added the Hartmann fissure, a thin and vulnerable point near the apex of Petit's triangle, and a subcostal weak spot between the twelfth rib and the lumbocostal ligament of Henle.

Lumbar hernia is often a subperitoneal lipoma surrounded by a peritoneal cul de sac (Figs. 1 and 2). The sac when present has a body and a neck; the latter is noticeable,

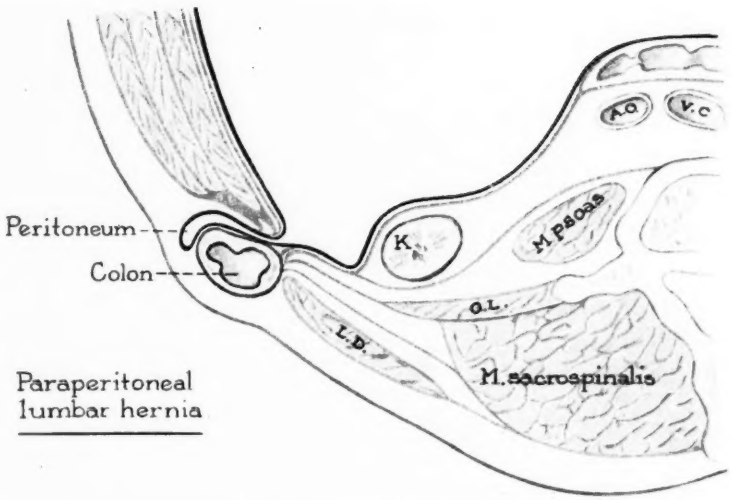

Fig. 5.—Structures concerned in paraperitoneal lumbar hernia. (Thorek, Max: *Modern Surgical Technic*, Lippincott 1950.)

for the abdominal opening is apt to be rather wide. The thickness of its walls is variable, and so is its size. Marmisse described fatty hernias without sacs as early as 1862. Also, hernia involving the kidney is not accompanied by a sac, because of the subperitoneal situation of this organ. Large hernias, as a rule, are subcutaneous; smaller ones are sometimes separated from the skin by a layer of fat. The most frequent covering is the external oblique muscle.

The contents of a lumbar hernia may include omentum, fat, mesentery, intestine (large or small), the appendix, the cecum, the stomach, the sigmoid flexure or (very rarely) the kidney (Fig. 3). The length and course of the hernial opening are variable. The hernial aperture may be round, transverse, quadrangular or fissural. Its outline is determined and indicated by the muscle bundles and in some cases by the bony contour of the twelfth rib or the iliac crest. Its width is also variable. In a case reported by Tucker the opening extended from the false ribs to the iliac crest.

The layers of tissue covering the hernia vary according to the hernia's depth. A superficial hernia is generally covered by thin cellular tissue, but occasionally there is an accumulation of fat. The hernia site may be divided by fibrous bands, with protrusion of properitoneal fat tissue (Webb Jones). In some cases (Hume) the hernia lies beneath the latissimus dorsi muscle, lifting the muscle but not escaping beyond it.

I have not been able to find a satisfactory classification of lumbar hernia. Usually authors speak of a congenital type, which is due to malformation or maldevelopment in the prenatal period, affecting the muscles, aponeuroses, ilium, vertebrae or lower ribs, and an acquired type, which is again subdivided into (*a*) spontaneous lumbar hernia, which is probably due to a delayed effect of the conditions that produce the congenital type, aggravated by indirect injury from strain, obesity, extreme emaciation, hard physical labor or other causes; and (*b*) traumatic lumbar hernia, which may be due to any one of a number of direct causes, such as (*a*) a crushing blow, (*b*) a fall from a height (*c*) acute or chronic abscesses, (*d*) pregnancy, (*e*) necrosis of the iliac crest, (*f*) vertebral caries or (*g*) operative trauma.

Any debilitating disease may be a contributing factor, since loss of the fat which normally pads the vasculoneural orifices facilitates the rupture. Any sudden effort or strain, as in coughing or vomiting, may precipitate the de-

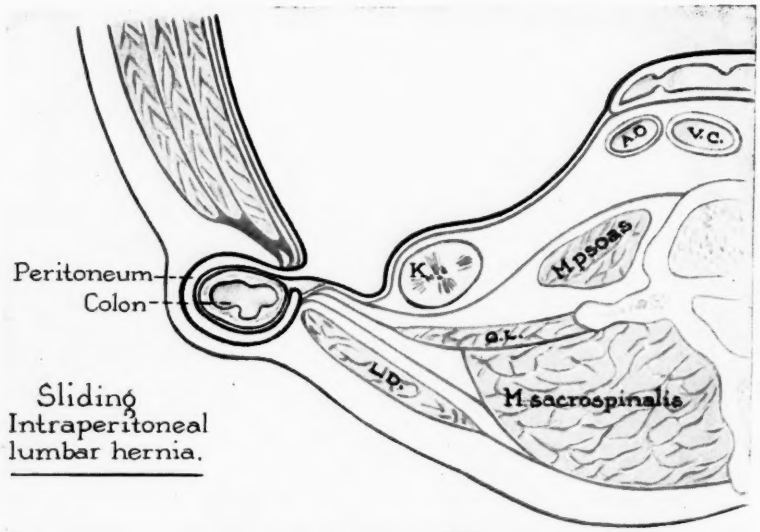

Fig. 6.—Structures concerned in sliding intraperitoneal lumbar hernia. (Thorek, Max: *Modern Surgical Technic*, Lippincott 1950.)

scent of the hernia. The effect of strain or trauma is sometimes much delayed; this is frequently observed in cases of hernia due to surgical trauma.

Thus, in the literature on lumbar hernia, classification is based on the presumed or actual etiologic factor responsible for the hernia. Such classification is not of much aid in operations for lumbar hernia. Moreover, in discussing classification of various types of lumbar hernia a great deal of controversy has arisen. There are those who state categorically that lumbar hernia has a sac. There are others who maintain just as emphatically that lumbar hernia has no sac.

To strike a happy medium, I propose the following classification, based on anatomic desiderata:

1. *Extraperitoneal Lumbar Hernia* (Fig. 4).—The term "extraperitoneal" applies to herniations of the viscera through any one of the lumbar spaces, in which the escaped contents have no peritoneal covering whatever.

2. *Paraperitoneal Lumbar Hernia* (Fig. 5).—This term describes the herniation of viscera or parts thereof accompanied by an adherent portion of the peritoneum following the descent of the hernia. (Most hernias of the paraperitoneal type are thickly covered with fat.)

3. *Complete Intraperitoneal (Sliding) Lumbar Hernia* (Fig. 6).—In this type the periotoneum not only accompanies the hernia in its descent but covers it entirely, forming a true peritoneal sac.

As to its incidence, lumbar hernias of all types, occur more frequently in the male than in the female. No age group is exempt, but middle-aged persons predominate. There seems to be some predilection for the left side.

No great difficulty is encountered in diagnosis of most lumbar hernias. The palpable tumor is the most prominent sign. It may vary in size from an inch to a foot (2.5 to 30 cm.) in diameter. Its shape tends to be round but may approach the oval. The smaller tumors are easier to locate. If bowel is implicated, reduction is likely to be accompanied by a distinct gurgling sound, while coughing at once reveals the hernial impulse and percussion yields a tympanitic sound.

Subjective symptoms may be few or absent; in some cases the patient may suffer from colicky pain, vomiting, fatigue, a dragged-down feeling, tenderness on pressure or pain in the back. In a great many cases the condition is asymptomatic, the hernia attaining a

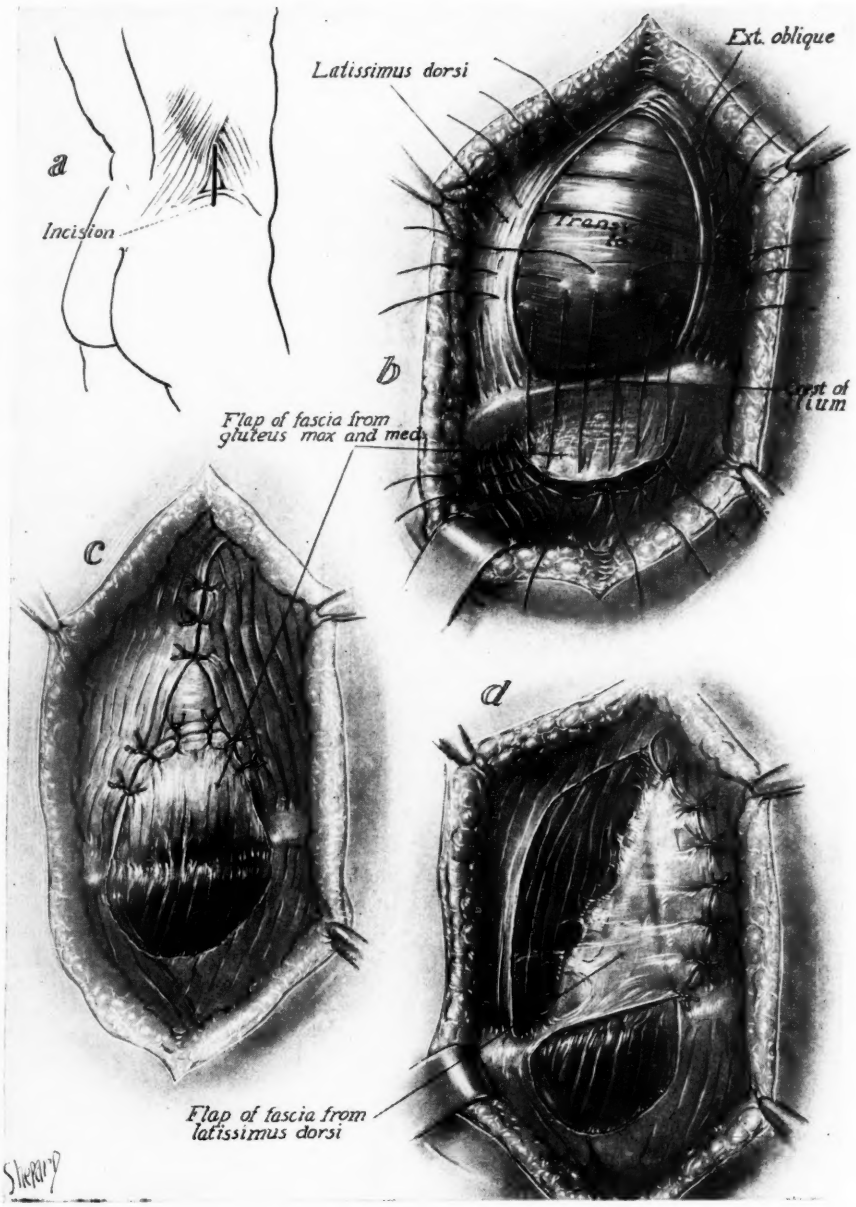

Fig. 7.—Dowd's operation for lumbar hernia. The line of incision is shown at point *a*. At point *b*, a flap of fascia lata and aponeurosis of the gluteus maximus and medius muscles is turned up and sutured to the lumbar fascia and the external oblique and latissimus dorsi muscles. After the flaps are sutured, a gap still remains (*c*). This gap is closed (*d*) with a flap of fascia from the latissimus dorsi. (From Watson, L. F., *Hernia*, C. V. Mosby, St. Louis).

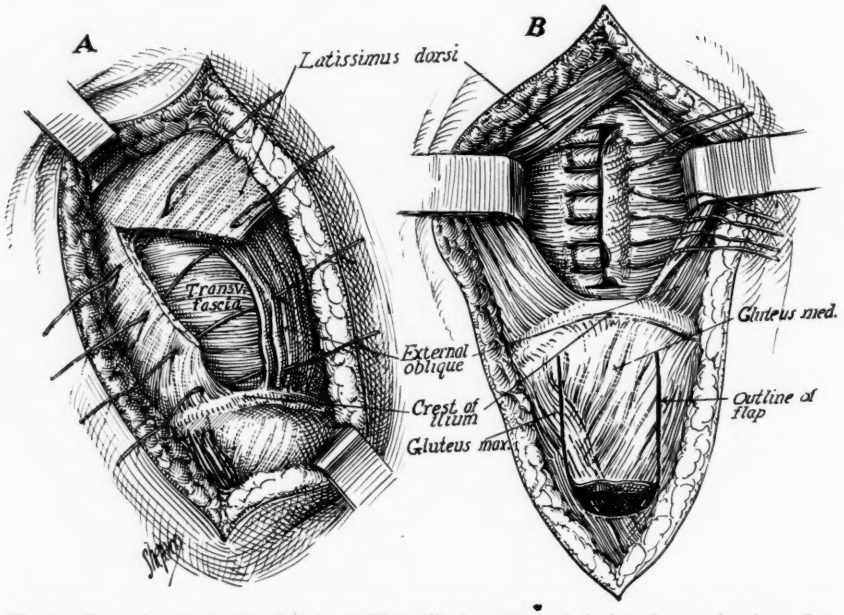

Fig. 8.—Operation for lumbar hernia. *A*, Rishmiller's method of closing the opening by a flap obtained by splitting the latissimus dorsi and overlapping the superficial fascia. *B*, S. Warbasse's method of overlapping flaps of transversalis fascia and reinforcing with a flap turned up from the fascia below the crest of the ilium. (From Watson, L. F., *Hernia*, C. V. Mosby, St. Louis).

large size before the patient becomes fully aware of its presence. Fatty hernia may present diagnostic problems, since even a reducible fatty hernia may be mistaken for an enterocele.

Diagnostic difficulties are chiefly associated with irreducible or strangulated hernia. Strangulation by constriction is comparatively rare in lumbar hernia. It is most frequent in the spontaneous type and is apt to be due to volvulus or to constriction of the neck of the sac.

Lumbar hernia must be distinguished from (*a*) abscess, (*b*) lipoma, (*c*) fibroma, (*d*) muscle hernia, (*e*) hematoma and (*f*) Pott's disease. None of these latter conditions will produce subjective symptoms characteristic of intestinal obstruction or strangulation, and they can all be distinguished from reducible lumbar hernia by the fact that the swelling is not reducible by manipulation and is not affected by coughing. No hernial orifice can be palpated.

In most cases of lumbar hernia the prognosis is favorable.

TREATMENT

The treatment of lumbar hernia may be mechanical. Being reducible in nearly all cases, the protrusion can sometimes be controlled by an appropriate truss or a bandage. This, however, is not satisfactory if the hernia increases in size, as it is likely to do in children. Radical surgical intervention is always the treatment of choice except in the presence of definite contraindications offered by the age and general condition of the patient.

The operative technic depends upon the type of hernia encountered. An incision is made over the center of the tumor, beginning just below the twelfth rib and extending downward to the iliac crest. The incision should be long enough for full exposure of all anatomic parts and the identification of structures. The sac, if present, should be located; it is never adherent to the skin and as

a rule is covered with fat, not muscle. If there is any difficulty in finding it, dissection should proceed cautiously; there may be no sac but only a mass of subperitoneal fat. When the hernia consists of subperitoneal fat alone (adipocele) the pedicle should be lighted and the tumor excised. The edges of the aponeurosis should then be overlapped and the opening closed with interrupted or mattress sutures of chromic catgut.

A small hernial opening can be closed with purse-string sutures and overlapping of the fascia as in the closure of small ventral hernias. Inversion of the sac if small, without removal, will often suffice. If the hernia is large, the sac should always be resected.

A *large hernial opening* is difficult to close. Often it is possible, however, to detach a portion of the latissimus dorsi or the external oblique muscle, bring it over the opening, and suture it in place. An excellent method is to overlap flaps of the transversalis fascia (Watson). Longer flaps can be secured if the flap incision is crossed at each end by a short transverse incision. In the presence of a very large gap, a flap of fascia may be turned up from below the crest of the ilium (Dowd, Rishmiller, and Warbasse, Figs. 7 and 8). The muscles are then brought together, the superficial fascia sutured and the wound closed. If the opening is large, I have used tantalum mesh with success.

Strangulated lumbar hernia calls for immediate surgical intervention, the technic of which is similar to that for strangulation located elsewhere.

REPORT OF CASES

CASE 1: *Incarcerated Left Paraperitoneal Lumbar Hernia.*—G. W., a white man aged 69, was admitted to the American Hospital with symptoms of intestinal obstruction and urinary disturbance. His general condition was good. The history revealed that he had sustained an injury to the back many years before.

Examination revealed a mass in the left lumbar region, about the size of a fist and tender to the touch (Fig. 9 left). The mass extended to the front and could not be reduced. There was much tenderness in the left upper quadrant, extending downward. The diagnosis was possible tuberculous abscess with local peritonitis, or an incarcerated or strangulated lumbar hernia.

Operation was performed on Jan. 29, 1949, pontocaine with dextrose being employed for anesthesia. The patient was placed in the kidney position. A longitudinal incision was made posterolaterally over the mass, extending to the iliac crest. Wide dissection of skin flaps was made, and the border lines of the lumbar space were identified. A mass the size of a small fist was found protruding through the Grynfeltt-Lesshaft space. The hernial opening was large, about 1¾ inches (3.3 cm.) across, and circular. The protruding mass was dissected and found to consist of components of Gerota's capsule (pararenal fascia), giving the impression of a pseudosac firmly attached below to the upper pole of the kidney, which herniated through the opening into the lumbar space. It was then evident that a paraperitoneal hernia was present.

The mass was resected, the kidney reposited, and the muscular and fascial components of the large space repaired with interrupted chromic catgut sutures. A quadrilateral tantalum wire mesh reinforcement, 2½ inches (6.2 cm.) square and corresponding in size to the original hernial opening, was sutured into place with No. 24 cotton sutures over the repaired external oblique muscle. The subcutaneous fascia and skin were closed over with interrupted No. 24 cotton sutures.

The patient made an uneventful recovery. The sutures were removed on the twelfth day, and the patient left the hospital.

The postoperative diagnosis was incarcerated left paraperitoneal lumbar hernia consisting of the components of Gerota's capsule and kidney.

Nine months later a checkup roentgenogram showed no irritation. The man had no pain and was in good condition, and the tantalum mesh implant was in position (Fig. 9 right).

CASE 2: *Left Lumbar Hernia (Adipocele).*—F. S., a white man aged 41, entered the hospital with a history of injury over the left lumbar area at the age of 16. In 1947, while pushing a car, he fell against the bumper and immediately felt sharp pain along the last rib on the left side and in the left lumbar region. Soon afterward he noticed that, when he coughed, a mass would protrude from the left lumbar area. For three months prior to admission he had felt gnawing pain during exercise, which was reflected along the posterior aspect of the thigh. He experienced this same pain in cold weather.

Examination showed a small palpable mass in about the middle of the left lumbar region, measuring approximately 4 by 1 cm. The mass became more prominent on coughing.

Diagnosis was made of a possible fibroneuroma or a possible lumbar hernia.

Operation was performed on Feb. 11, 1949, pontocaine with dextrose being used for anesthesia.

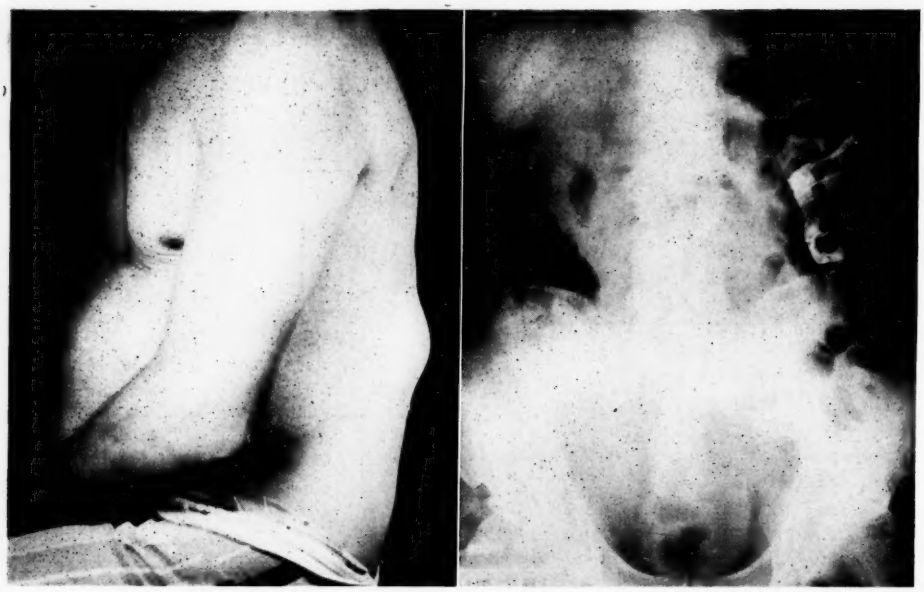

Fig. 9.—Paraperitoneal lumbar hernia. *Left,* before operation; *right,* nine months after operation, showing tantalum reinforcement in place. (Thorek, Max: *Modern Surgical Technic,* Lippincott 1950.)

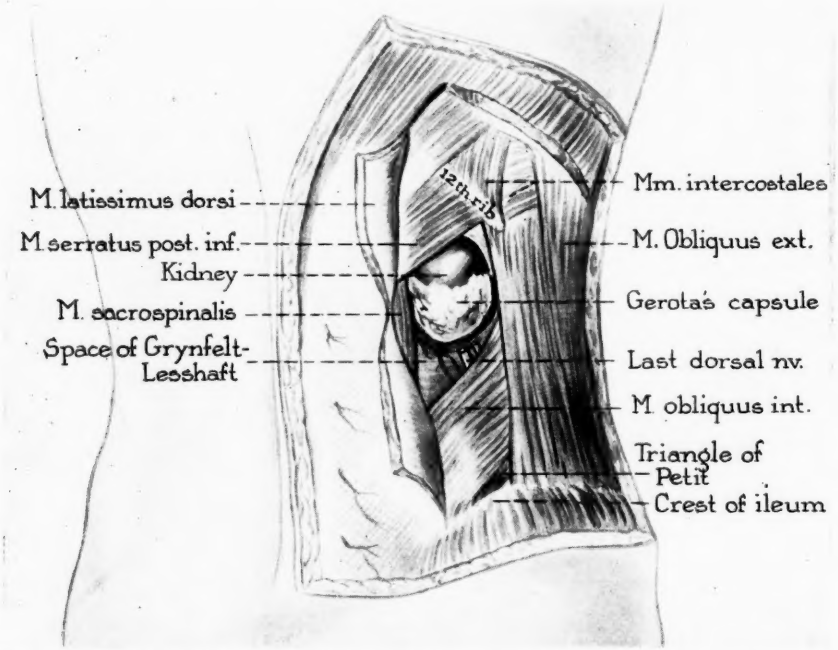

Fig. 10.—Paraperitoneal lumbar hernia through the space of Grynfelt-Lesshaft, consisting of Gerota's capsule and kidney. (Thorek, Max: *Modern Surgical Technic,* Lippincott 1950.)

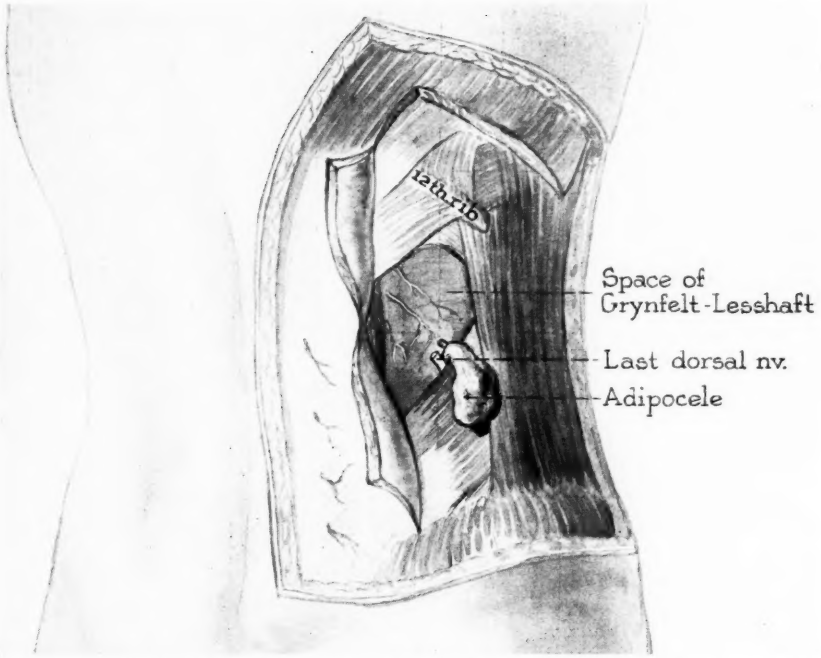

Fig. 11.—Lumbar hernia in the space of Grynfelt-Lesshaft, consisting of an adipocele. (Thorek, Max: *Modern Surgical Technic*, Lippincott 1950.)

The left lumbar space was dissected free. A yellowish protrusion the size of a walnut was observed (Fig. 10). Further dissection revealed that the mass emerged from an opening in the posterior layer of lumbodorsal fascia and was accompanied by one of the lower lumbar arteries and its nerve. The tumor was removed and the blood vessel ligated. Repair of the defect was made by overlapping the adjacent fascial structures. The skin was closed in the usual manner with interrupted No. 24 cotton sutures. Primary union was effected.

The patient was ambulatory the second day and left the hospital the fifth day. A month later he reported that the pains along the thigh and in the back had completely ceased since the removal of the tumor.

The postoperative diagnosis was left lumbar extraperitoneal hernia (adipocele; Fig. 11).

SUMMARY

Lumbar hernia, which may occur at any point in the lumbar region, may be either congenital or acquired. If congenital, it is due to defective prenatal development. Acquired lumbar hernia may be either spontaneous or traumatic. If spontaneous, it is probably due to a delayed effect of some prenatal weakness; if traumatic, to injury or strain.

I have classified lumbar hernia as (*1*) *extraperitoneal:* herniations of the viscera through either lumbar space, in which the escaped contents have no peritoneal covering; (*2*) *paraperitoneal:* herniation of viscera or parts thereof, accompanied by an adherent portion of the peritoneum following the descent of the hernia, and (*3*) *complete intraperitoneal (sliding)* lumbar hernia with the peritoneum accompanying its descent and covering it entirely, forming a true peritoneal sac.

Lumbar hernia may be either unilateral or bilateral, the unilateral type being more frequent in the acquired form. It occurs more often in the male than in the female and shows a predilection for the left side of the body. There is no age limit in either direction, but the highest incidence is among persons of middle age.

The treatment of choice is radical operation unless definitely contraindicated. The prognosis is generally favorable.

Cases of Lumbar Hernia Reported in Literature

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Garengeot	1731		F	Wrong step	Between rt. iliac crest and false ribs	Strangulated	Bowel		Patient died
Petit	1733	Middle	F	Pregnancy	Between iliac crest and false ribs (left)	Strangulated		Operation (?)	
Ravaton	1738	Middle	F	Pregnancy, repeated vomiting	Left flank	Strangulated	Bowel, epiploon	Operation	Patient cured
LeMaire (LaChausse)	1759	Middle	M	Other hernial protrusions present	Left and right lumbar regions				
Desault	1791	Young	M	Fall from 4th floor	Lateral abdominal wall				
Monro	1802	6 mo.		Congenital	Under false ribs (left and right)	Reducible, not retainable	Kidneys		Patient died
Lassus	1806		M	Blow by steering wheel	Right lateral and inferior parts of abdomen	Reducible			
Richerand	1815		M	Scar following wound	Right flank	Reducible			
Cloquet	1819	65	M	Effort in lifting weight	Between rt. iliac crest and 12th rib	Strangulated		Truss	
Decaisne	1839	6		Fall of 30 feet	Petit's triangle (left)	Reducible	Bowel		Patient died from other cause
Verdier	1840		M	Fall on rt. flank	Between rt. iliac crest and 12th rib	Reducible		Truss	

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Van Hengel	1848		F	Acute abscess, fall 36 yrs. before	Under false ribs (left)		Bowel	Abscess opened spontaneously	
Colles	1857	12 mo.	F	Congenital, with scoliosis	Left flank	Reducible			
Nelaton	1857		M	Blow by buffer	Left flank	Reducible			
Marquez	1859		F	Effort, many pregnancies	Between l. iliac crest and 12th rib	Strangulated	Bowel, epiploon		
Chapplain	1861	60	M	Blow by car (thrown against wall)	Between rt. iliac crest and 12th rib	Reducible	Bowel, epiploon		Twelfth rib highly movable
Marmisse	1862	72	F	Obesity (?)	Between l. iliac crest and false ribs	Never reduced	Bowel, epiploon		Observations made on cadaver
Schraube	1863	31	M	Impact on stone	Between l. iliac crest and 12th rib				
Basset	1864	18	M	Familial	Posterior part of left flank	Reducible	Epiploon (?)	Truss	
Grynfeltt	1866	70	M	Violent blow on flank	Posterior part of left flank	Reducible strangulations	Bowel	Truss	
Sistach	1867	46	M	Scar following hematoma	Left flank	Reducible		Truss	
Hardy	1869	30	F	Necrosis of iliac bones, effort due to constipation	Over iliac crest (left)	Reducible	Bowel		

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Triponel	1869		F	Effort	Right lumbar region	Strangulated, reduced		Truss	
Larrey	1869	30	M	Blow by gun, abscess, scar	Under 12th rib	Strangulated, reduced	Bowel, epiploon		
Auzias-Turenne (Larrey)	1869	Old	F		Left side	Reducible	Omentum		
Dolbeau (Larrey)	1869	Adult	F		Lumbar region			Operation on abscess	
Levy	1869	Old	F		Petit triangle (left)	Reducible			
Duplay (Rigodin)	1872	68	F	Kick, abscess, scar	Left lumbar region	Reducible strangulations	Bowel	Truss	Patient died from strangulation
Broca (Rigodin)	1872	72	M	Impact of lumbar region against staircase	Grynfeltt space (left)	Incompletely reducible	Epiploon	Truss	
Apperson	1873	63	F	Many pregnancies	Right lumbar region	Reducible strangulations		Truss	
Campbell	1874	4	M	Scar of spinal abscess	Between l. iliac crest and 12th rib	Reducible	Bowel		
Coze	1874	Adult	M	Effort in riding	Apex of Petit triangle (right)	Reducible, not retainable			
Coze	1874	Adult	M	Effort in riding	Petit triangle (right)	Reducible	Colon	Truss	
Braun	1879	33	M	Spondylitic abscess, not open, double	Petit triangle (left)	Reducible	Bowel		Observations made at autopsy

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Braun	1879	24	M	Necrosis of external part of iliac crest	Over iliac crest (right)	Reducible	Colon		
Monro, Jr.	1879	Adult	M	Effort in lifting cask of sugar	Near 1st lumbar vertebra (right and left)				
Currier	1880	70	F		Between iliac crest and false ribs (right)	Reducible			
Wolff	1880	24	M	Absence of part of iliac bone	Petit triangle	Reducible	Colon		
Starcke	1880			Incision of lumbar abscess					
Burow	1880								
Bayer	1880	6	F	Scar from acute abscess	Right Grynfeltt space	Reducible			
Gosselin	1881	55	M	Lumbar scoliosis	Petit triangle (left)	Reducible	Bowel		
Owen	1888	6	F	Scar from abscess	Right lumbar region		Bowel	Operation	Patient cured
Dumesnil, Brunon	1889	61	M	Spontaneous	Left lumbar region	Reducible	Bowel	Truss	
Gage	1889	17	M	Congenital	Left flank	Reducible			
Hume	1889	68	M	Spontaneous (?)	Left Grynfeltt space	Reducible strangulated	Bowel	Operation	Patient died

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Hutchinson	1889	65	M	Spontaneous (?)	Left Grynfeltt space (Hartmann fissure)		Bowel		Observations made on cadaver
Kingdon (Macready)	1890	64	M	Effort in lifting heavy weight	Petit triangle (left)	Reducible	Omentum		
Wolff (Lieber)	1890	3	M	Spinal abscess	Petit triangle				
Macready	1890	54	M		Petit triangle (left)	Not reducible	Adipocele (?)		Patient cured
Macready	1890	30	M	Spontaneous (?)	Petit triangle (right)	Reducible			
Macready	1890	16	M	Congenital	Below and in front of 12th rib (right)			Truss	Patient cured
Macready (Chaplin)	1890	17	M	Congenital	Lumboventral region (right and left)	Reducible			
Mastin	1890	6	M	Congenital	Left lumbar region	Reducible			
Smith (Macready)	1890		M	Congenital					
Wyss	1892	10 mo.	M	Congenital	Right lumboventral region				Observations made at autopsy
Shepherd	1892	60	M		Grynfeltt space (Hartmann fissure)		Fat		Observations made on cadaver
Tucker	1893	35	F	Pregnancy	Rt. flank groin	Not retainable	Intestine, stomach	Operation	Patient cured

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Starr	1894		M	Lifting heavy weight	Between iliac crest and last rib	Reducible			
Berger	1895	Young	F	Congenital	Lumbar region (right and left)				
Berger	1895		F	Scoliosis	Between iliac crest and 12th rib				
Coley	1895	21 mo.	M	Congenital	Left triangular space	Reducible		Operation	
Galloway	1895	Adult	M	Spontaneous	Left flank				
Raymond	1897	35	M	Scar following wound	Petit triangle (left)	Reducible	Fat	Operation	Patient cured
Russell	1898	Young	M	Congenital					
Bestendonk	1899	20	M	Kyphosis of dorsolumbar vertebrae, previous abscess	Under 12th rib (right)	Reducible	Ascending colon, fat	Operation	Patient cured
Schenk	1900	Newborn	M	Congenital	Grynfeltt space (right)	Reducible			
Morestin	1901				Sacrolumbar aponeurosis		Fat		Observations made on cadaver
Desmoulin	1901	55	M	Effort in lifting weight	Grynfeltt space (right)	Reducible	Lipoma	Operation	
Nachod	1901	Newborn	M	Congenital	Abdominal wall (right)	Reducible			

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Borchardt	1901	15 mo.	M	Congenital	Lumboventral region (left)	Reducible	Bowel		Observations made at autopsy
Zentner	1901	6	F	Spontaneous (cough, effort)	Lesshaft triangle (left)	Reducible	Omentum	Operation	Patient cured
Hein	1902				Between 12th rib and iliac crest		Fat		
Webb Jones	1902	45	M	Spontaneous (?)	Petit triangle (right)	Reducible	Colon	Operation	Patient cured
Baracz	1902	2½	F	Congenital	Between costal arch and iliac crest (right)	Reducible		Truss	
Baracz	1902	11	F	Effort in lifting table	Under left 12th rib (Grynfeltt space)	Reducible	Bowel	Truss	Patient cured
Baracz	1902	16	M	Blow by iron shaft	Under left 12th rib (Grynfeltt space)	Reducible	Bowel		
Baracz	1902	62	M	Heavy work	Under left 12th rib (Grynfeltt space)	Not reducible	Fatty hernia (?)		
Baracz	1902	13	M	Scoliosis	Under left 12th rib (Grynfeltt space)	Reducible			
Jeannel	1902	4 mo.	M	Congenital	Right side	Reducible		Operation	Patient cured
Gaillac	1903	Adult	M	Effort in jumping	Lumbar region	Reducible			

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Tereschenkow	1903	47	M	Spontaneous (?)	Under 12th rib (Grynfeltt space) (left and right)	Reducible	Fat	Operation	Patient cured
Küttner	1905				Under 12th rib (Grynfeltt space)				
Lejars	1905	65	M		Petit triangle (left)	Strangulated	Colon	Operation	
Namba	1907	4 mo.	M	Congenital	Between 12th rib and iliac crest (left)		Colon, kidney		Observations made on cadavar
Dowd	1907	3½	M	Congenital	Petit triangle (right)		Appendix	Operation	
Ruppanner	1908	48	M	Effort in lifting heavy table	Under last rib (left)		Fat	Operation	
Hurley	1908	4	M	Attack of whooping cough	Below 12th rib	Reducible	Part of ascending colon (?)	Tight girdle with pad over hernia	
Hammond	1909	38	F	Many pregnancies	Right iliocostal space, from iliac crest to ribs	Irreducible, owing to adhesions		Operation	Patient cured
Bertrand	1909		M	Kyphosis of last thoracic vertebra					
Saxl	1909			Spondylitic abscess					
Franck	1910	47	M	Direct trauma, incised hematoma	Lumbar region (left)			Truss	

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Anisimow	1911	7	M	Spondylitic abscess	Lumbar region (right)			Operation	Patient cured
Claeys	1911	2	F	Spondylitic abscess, kyphosis	Above iliac crest (left)	Reducible	Fat, colon	Operation	Patient cured
Berdjajew	1911	24	M		Grynfeltt space (right)		Epiploon, prehernial lipoma	Operation	Patient cured
Duncker	1911	54	M	Effort in lifting weight	Below left 12th rib	Reducible	Fat	Operation	Patient cured
Friedenthal	1911	45	F	Effort during falling, repeated pregnancies	Below left 12th rib	Strangulated, reducible			
Secousse, Lasserie	1913	Adult	M	Effort in carrying weight	Left lumbar region	Reducible	Bowel (?)		
Preuss Kriegsmin	1913	Adult	M		Petit triangle			Operation	Patient cured
Campora	1915	61	M	Effort	Grynfeltt space (left)	Reducible	Fat	Operation	Patient cured
Goodman, Speese	1916	58	M	Effort	Grynfeltt space (left)	Reducible	Bowel		
Rishmiller	1917	31	M	Crushing of thighs by train wheel, extensive deep injury over left iliac crest, 3 years before	Petit triangle (left)		Piece of bone	Operation	Patient cured
Turner	1917	55	M	Fall	Petit's triangle (left)	Reducible	Loop of bowel, no sac	Operation	Patient cured

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Hancock	1920	40	M	Being thrown from railroad car	Petit's triangle (left)	Reducible		Operation	Condition recurred
Fuld	1920	64	M		Lumbo-abdominal region (left)	Reducible, strangulations	Epiploon	Truss	
Fuld	1920	65	F		Over iliac crest	Reducible, strangulations	Epiploon	Truss	
Goebel	1920	54	F	Effort in falling on side	Grynfeltt space (right)				
Serafini	1921	61	M		Grynfeltt space (left)	Reducible	Bowel	Operation	Patient cured
Coley	1921	25	M		Petit's triangle (right and left)	Painful on exercise	No sac	Exploratory incision, closure without repair	Condition recurred
Lambret, Dhalluin	1922	53	M		Grynfeltt space	Reducible	Epiploon		
Maidàgan	1922	13	F	Previous spondylitic abscess	Left side		Bowel, kidney	Operation	
Ravdin	1923	40	M	Previous wound	Below 12th rib (Grynfeltt space) (left)	Reducible		Operation	
Ciaccio	1924	18 mo.	M	Congenital	Costolumbar abdominal triangle (right)	Reducible	Kidney	Operation	
Sillman (Ali Krogius)	1925	43	M	Effort in lifting weight	Below 12th rib (left and right)	Reducible	Fat	Operation on right side	

Cases of Lumbar Hernia Reported in Literature (Continued)

Author	Date	Patient		Cause	Hernia			Treatment	Comment
		Age	Sex		Site	Condition	Contents		
Virgillo	1925	21	M	Heavy work	Grynfeltt space (left)	Reducible	Fat	Operation	
Sarnoff	1932	37	F	Injury in fall off streetcar a year after nephrectomy	Left lumbar region	Incompletely reducible	Large omentum, descending colon, many coils of small bowel, part of ovarian cyst	Operation	Patient cured
Edwards	1933				Grynfeltt space		Fat attached to ascending colon	Operation	
Turner	1933	64	M		Petit's triangle (left)	Reducible	Diverticulum of descending colon		
Higham	1935	31	M	Heavy lifting 7 years before	Petit's triangle (right)	Not reducible, superficially edematous	Gangrenous appendix	Operation (no attempt to repair orifice, since high cecum occluded it naturally)	Arrested descent of cecum permitted appendix to enter sac
Kelton	1939	45	F	Kidney operation	Right lateral abdominal region			Operation	
Sibilla	1941	50	F	Operation for calculus	Left lumbar region	Reducible		Operation	Patient cured
Kapsinow	1943	48	M	Effort in dragging electric poles	Over iliac crest (left)		Part of descending colon	Operation	Patient cured

Stubenbord	1944	23	M	Twisting during repair of car	Over iliac crest, left loin		Bowl, right kidney, meningocele	Operation on right	Patient cured
Fliekinger, Masson	1946	41	F	Congenital	Petit's triangle (left and right)	Reducible			Tubo-ovarian abscess on left; cystic oophoritis on right; successful repair on right; left to be treated later
Thorek, Max	1949	69	M	Injury to back	Grynfeltt-Lesshaft space	Not reducible	Components Gerota's capsule and kidney	Operation	Patient cured
Thorek, Max	1949	41	M	Injury to back	Left lumbar region	Not reducible	Lower lumbar arteries and nerve; fat	Operation	Patient cured

SOMMAIRE

La hernie lombaire peut survenir en toute région lombaire; elle peut être congénitale ou acquise. Si congénitale, elle est dûe a un develop pement prénatal défectueux. La hernie lombaire acquise peut être ou spontanée ou traumatique. Si spontanée, elle est probablement due au développement rétarde de quelques faiblesses pré-natales; si acquise, elle est due à un effort, à un traumatisme.

Je classifie les hernies lombaires ainsi: 1) *extrapéritoneale:* la hernie des viscères se faisant à travers un espace lombaire quelconque, la hernie n'ayant aucun revêtement péritoneal; 2)—*parapéritoneale:* hernie des viscéres, accompagnées par une portion adhérente du peritoine accompagnant la naissance de la hernie; 3)—*Complètement intrapèritonéale*: la hernie lombaire glissante avec le peritoine qui accompagne son développement et la couvre entièrement, formant un sac peritóneal.

La hernie lombaire peut être unilatérale ou bilatérale: le type unilatéral est le plus fréquent. Cette hernie se rencontre plus souvent chez le mâle que chez la femelle et montre une prédilection pour le côté gauche du corps. Elle peut apparaître à tout âge, mais cela a lieu le plus fréquemment chez les personnes de l'âge moyen.

Amoins qu'il n'y ait une contre-indication très définie, le traitement de choix est l'opération radicale. Le pronostic est généralement favorable.

ZUSAMMENFASSUNG

Lumbalhernien koennen an jeder Stelle der Lendengegend auftreten, und sind entweder angeboren oder erworben. Die angeborenen sind die Folge mangelhafter Entwicklung vor der Geburt. Erworbene Lendenbrueche koennen spontan oder als Folge von Verletzungen auftreten. Die spontanen muessen wohl als Spaetfolgen einer vod der Geburt entstandenen Schwaeche aufgefasst werden; die traumatischen kommen durch Verletzung oder Zerrung zustande.

Ich habe die Lendenbrueche in folgende Gruppen eingeteilt:

1. *Extraperitoneale* Herniierung von Eingeweiden durch einen der beiden Lumbalspalte, wobei die entschluepften Teile keinen Bauchfellueberzug haben.

2. *Paraperitoneale* Herniierung von Eingeweiden oder Eingeweideteilen, die nach dem Absinken des Bruches noch von einem anhaftenden Stueck Bauchfell begleitet werden.

3. *Voellig intraperitoneale (gleitende)* Lumbalhernie, wobei das Bauchfell die absteigende Hernie begleitet und sie unter Formung eines echten Bauchfellsackes vollstaendig einhuellt.

Lendenhernien koennen einseitig oder doppelseitig auftreten. Die einseitige Form kommt haeufiger unter den erworbenen Hernien vor. Lendenbrueche sind bei Maennern haeufiger als bei Frauen und bevorzugen die linke Koerperhaelfte. Eine Altersgrenze gibt es weder nach oben noch nach unten, am haeufigsten aber werden Personen im mittleren Lebensalter betroffen. Die Behandlung der Wahl ist die Radikaloperation, sofern nicht ausgesprochene Gegenindikationen vorliegen. Die Prognose ist im allgemeinen guenstig.

RIASSUNTO

Le ernie lombari possono essere congenite o acquisite. Le congenite sono dovute ad un difettoso sviluppo prenatale. Le ernie acquisite possono essere invece spontanee a traumatiche. Le spontanee sono probabilmente la conseguenza tardiva di una debolezza muscolare prenatale. Le ernie traumatiche derivano invece da una lesione o da uno sforzo eccessivo.

L'A. classifica le ernie lombari in: (1) extraperitoneali, nelle quali gli organi erniati attraverso un difetto dei muscoli lombari non hanno un rivestimento peritoneale: (2) paraperitoneali, nelle quali gli organi o parte degli organi erniati sono accompagnati dal peritoneo che aderisce loro e che segue l'ernia nella sua discesa: (3) completamente intraperitoneali (per scivolamento), nelle quali il peritoneo accompagna e riveste intieramente l'ernia, formando un vero sacco.

Le ernie possono essere mono- o bilaterali: quelle monolaterali sono piu' frequenti nelle forme acquisite. Colpiscono piu' spesso il sesso maschile e ricorrono piu' frequentemente a sinistra. Non esisterebbe un limite di eta': la maggiore frequenza e' pero' nell'eta' media.

Qualora non esistano particolari controindicazioni, la cura di elezione consiste nell'operazione radicale. La prognosi e' generalmente favorevole.

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Echoes of the Past

III. Georges Clemenceau, Physician to the Poor

During World War I all nations learned of Georges Clemenceau, Premier of France. He was familiarly called "The Tiger of France." His was a stormy life, filled with many episodes of "blood and thunder." Georges Clemenceau (1841-1929) has found a permanent place in French history as a great statesman.

Clemenceau entered public life during the Second French Empire. At that time the call to democracy was being heard throughout France. The "Tiger" was a radical and became a candidate for Mayor of Montmartre. He was elected mayor, served well and soon found himself a member of the Chamber of Deputies.

In 1880 he founded the newspaper *La Justice*, the official publication of French radicals. He became the leading journalist of Paris and, subsequently, of France. During the famous Dreyfus trial Clemenceau sided with Dreyfus and dedicated his new paper *L'Aurore* to the defense of the accused. Dreyfus was convicted and sentenced to Devil's Island. Five years later, after constant agitation, Clemenceau brought about a new trial. Finally it was declared that Dreyfus was the victim of perjury and forgery. He was exonerated and restored to his command in the army.

By this time Clemenceau was a national figure. In 1902 he was elected to the French Senate. Four years later he became Premier of France, resigning in 1911.

In 1917, during World War I, the position of France was perilous. The people called upon Clemenceau to become Prime Minister as well as Minister of War. This he did, and at the age of 76 he became not only "the Tiger of France" but "the Savior of France." But this repetition of the political success of a great statesman is but the superstructure; let us look into the background of Clemenceau, the poor physician to the poor. Little has been written of "the Tiger" as a poor physician in Montmartre before he entered politics by seeking the office of mayor.

Clemenceau was born in a little town on the Bay of Biscay. His father was a physician, as was his grandfather. Following a prescribed curriculum, he qualified as a medical student and entered the hospital at Nantes. He finally matriculated at the University of Paris, from which he received his medical degree. After graduation he returned to Montmartre, where he established himself as a country physician.

Medical practice was interrupted for three years while Clemenceau visited America. During this visit he married Miss Mary Plummer in New York (June 23. 1869), after which he returned to medical practice in Montmartre. His parents were people of the working classes. He did not have a lucrative practice, but he had many patients. He found himself more concerned with their social problems than with their physical ills; he was a poor physician both from a financial and a medical viewpoint.

His free medical service to the people of Montmartre made him so popular that when he decided to abandon medicine for politics he had many devoted followers in Montmartre. His election as mayor launched him on his outstanding political career.

Medical history records nothing of value under the name of Georges Clemenceau, but the political history of France is voluminous in tribute to the nation's "Savior." Here again are recorded the successful accomplishments of an unsuccessful physician.

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Principles and Applications of Stereoencephalotomy

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PHILADELPHIA

IN TREATING various diseases of the central nervous system it is desirable to carry out therapeutic procedures in the depth of the brain. The classic methods of brain surgery necessitate the exposure of deep-lying areas. Usually this is associated with unavoidable damage to parts of the brain located above the region which the surgeon attempts to reach. However, over forty years ago a method was introduced by Horsley and Clarke[1] for experimental work in animals, permitting the surgeon to place lesions in deep-seated areas of the brain with minimum injury to overlying structures. Curiously enough, as far as we know, this method was not applied to man prior to our first publication[2] in 1947.

The main reason for the long-continued limitation of this method to experimental animals is the great variability in size and shape of the skull in man. This makes it impossible to place a lesion in a certain subcortical area with any degree of accuracy if one uses a landmark of the skull as a point of reference—for instance, the external auditory meatus. This is possible only in animals in which the size and shape of the head are approximately uniform; for instance, cats and monkeys. We have tried to overcome these difficulties as regards the human skull by using a point within the brain, usually the pineal body, as a reference point. Its position in relation to the coordinates of the apparatus is determined by simple roentgen photographs of the skull with the apparatus in situ if the pineal gland is calcified. Otherwise, pneumoencephalographic visualization of the ventricles is necessary.

The apparatus, which we have called the stereoencephalotome, consists of an electrode carrier, a cubiform frame and a base. The carrier can be mounted to the top, the sides or the back of the frame; it allows the electrode to be moved in any plane. The base originally consisted of a ring upon which was mounted a plaster cast of the skull prepared individually for each patient. The present apparatus (Fig. 1) eliminates the plaster cast and anchors the base of the stereoencephalotome to the skull by means of four rubber plugs or by four stainless steel pins which are inserted into small drill holes in the skull. The base of the apparatus is aligned so that its frame is parallel to a plane determined by the inferior border of the orbits and the external auditory canals, the so-called horizontal plane. As has been mentioned, the coordinates of the apparatus are referred to a point within the brain, namely the pineal gland. Roentgenograms are taken with the apparatus in position, and the relation of the pineal gland to the electrode is established.

In order to be able to reapply the base at operation in exactly the same position it occupied during the roentgenographic procedure, the following precautions are taken: An additional superstructure containing five movable pins (one at the intersection of the sagittal and interaural planes, two in the sagittal plane and two in the interaural plane) is mounted to the frame (Fig. 2); the points of the scalp touched by the pins are tatooed before the roentgenograms are taken. Furthermore, the distance between the upper end of the tubes, in which the pins are movable, and the corresponding tattoo marks is measured. Before operation the base has to be reapplied in such a way that the pins exactly touch the tattoo marks and that the aforementioned distances are the same as when the roentgen films were taken. If the pineal gland is not visualized then a pneumoencephalogram is done, and the electrode is oriented with reference to the suprapineal recess or other structures in the neighborhood of the third ventricle. With these data and the aid of brain specimens sectioned in the planes of the stereoencephalotome, one can compute the coordinates necessary to produce the lesions desired, for instance of the dorsomedial nucleus of the thalamus (thala-

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motomy) or of the spinothalamic tract in the midbrain (mesencephalotomy).

Local or nitrous oxide—ether anesthesia is employed. The patient is placed in a semireclining position, and the base of the apparatus is applied. An 8 cm. tranverse scalp incision is made, usually in the interaural plane. A trephine opening is made just to the right or left of the midline, and the superior longitudinal sinus is exposed. The superstructure is applied to the base and the midline identified. The dura is punctured at the point where one wishes to introduce the electrode, and the latter is lowered according to the measurements obtained from the roentgen film. For production of circumscribed lesions we have found electrolysis preferable to electrocoagulation by high frequency current, which we had used in a part of our material. The needle electrode producing the lesion is connected to the anode of a D.C.; the cathode is a large indifferent plate electrode placed under the patient's buttocks. Where a small spherical lesion is desired the electrode consists of an insulated wire bared at its tip for a distance of 1.5 mm. Where several large lesions are desired, the electrode consists of an outer insulated tube through which passes a stainless steel stylet. The outer tube is closed at its pointed tip and has a side opening above the tip. The stylet may be pushed through the side opening for production of the lesion, then withdrawn and the entire electrode rotated. In this manner one can make several rosettes of lesions at any desired level, all through a single puncture. When the final lesion is made a droplet of pantopaque or lipiodol may be instilled through the stainless steel tube and its position verified postoperatively by roentgenographic study (Fig. 3). Occasionally, when there is residual air in the ventricles, one can ascertain the position of the electrode by recording subcortical potentials as the electrode passes through the lateral ventricle.

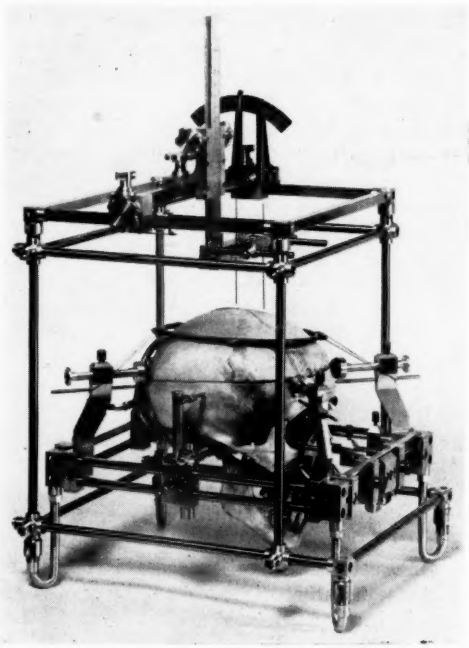

Fig. 1.—Stereoencephalotome (side view).

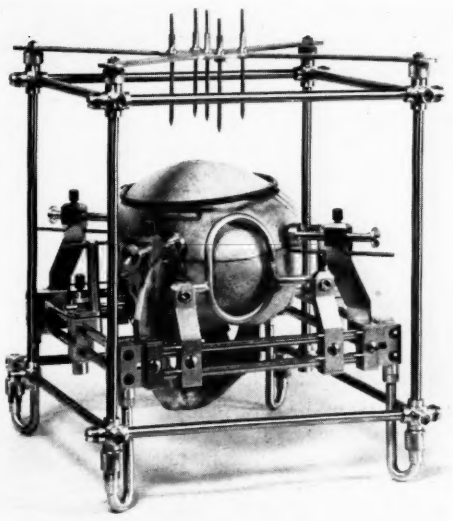

Fig. 2.—Stereoencephalotome (posterior view). Needle carrier is replaced by 5 pins for tattoo marks.

In this paper we should like to report our experiences with three of the numerous possible applications of stereoencephalotomy: (1) in psychosurgery; (2) in the treatment of unbearable pain, and (3) in the study and treatment of certain types of convulsive disorders.

I. THALAMOTOMY AND HYPOTHALAMOTOMY IN MENTAL DISORDERS

In the treatment of mental disorders thalamotomy represents an attempt to obtain the beneficial effects of prefrontal lobotomy, particularly in the emotional sphere, and to avoid its undesirable by-effects as far as possible. In prefrontal lobotomy one cuts through the white matter of the frontal lobe, interrupting the connections of the frontal association areas with other parts of the cerebral cortex and subcortical ganglia; often one also produces unintended lesions, particularly in the region of the basal ganglia. Topectomy and transorbital leukotomy also destroy association systems of the frontal lobe, as well as its projection systems.

Dorsomedial thalamotomy produces bilateral small circumscribed lesions in the dorsomedial nucleus of the thalamus, the nucleus which degenerates after prefrontal lobotomy (Freeman and Watts[3] and others). One attempts in this way to interfere with the corticothalamic interrelationships underlying the emotions, while the cerebral association systems are spared. In hypothalamotomy small unilateral or bilateral lesions are placed in the subthalamus and the lateral hypothalamic regions, which also seem to play an important part in the mechanism of emotions.

Forty-one patients, most of them institutionalized for schizophrenia, depression or severe compulsion neuroses, have been operated upon. The majority had been under psychiatric treatment for one to seventeen years and had also been subjected to various forms of shock therapy without relief. In 2 patients with obsessive compulsive neuroses, prefrontal lobotomies had been performed at other institutions without alleviation of the disturbances.

The material may be divided into four groups according to size, number and location of the lesions.

GROUP 1: *Single lesions (3 cases).*—In the first case (compulsive obsessive state and depression) we produced only one coagulation on each side; in the second (catatonic schizophrenia) 4 lesions were produced on the left and 1 on the right; in the third (mental deficiency with agitation) 2 lesions were produced in each dorsomedial nucleus. In view of the smallness of the coagulations, each covering about 1/36 of the volume of the dorsomedial nucleus, one could not expect a definite therapeutic effect from the few lesions placed in this initial group. There was a transitory improvement in Case 1, the patient becoming mildly euphoric and less irritable, exhausted and meticulous. This temporary amelioration, however, could hardly be regarded as a consequence of the lesions. These first 3 cases may serve as controls, showing that the psychologic and somatic effects of the operative procedures without sufficient lesions of the dorsomedial nuclei are not able to produce the permanent changes of emotional tone observed in patients in whom a larger number of electrocoagulations were produced in each dorsomedial nucleus.

GROUP 2: *Five coagulations in each dorsomedial nucleus through 3 puncture canals (8 cases).*

GROUP 3: *Large electrolytic lesions consisting of 2 or 3 rosettes in the dorsal, central and ventral parts of the dorsomedial nucleus produced through 1 single puncture canal on each side.* Each rosette consists of 4 ovoid lesions, i.e., an anterior, a medial, a posterior and an anterolateral lesion (remaining 30 cases).

GROUP 4: *Hypothalamic lesions.*—In a group of 7 patients, 1 schizophrenic patient of Group 2 who had relapsed and 6 schizophrenic patients in Group 3 in whom the lesions of the dorsomedial nuclei were insufficient to improve the psychic state, 1 to 3 lesions were placed unilaterally or bilaterally by means of electrocoagulation in the lateral hypothalamic area through a single puncture canal on each side. In order to minimize shock caused by bilateral hypothalamic lesions, they were produced in two stages, with an interval of several weeks between the first and the second operation.

A total of 59 operations was performed on 41 patients. A postoperative death occurred in 1 case in Group 2 and in 1 case in Group 3, so that the operative mortality was 3.4 per cent.

In successful operative cases, beneficial effects upon pathologic symptoms were obtained chiefly in the emotional sphere. Anxiety, tension and worry disappeared or were at least definitely reduced. The patients became more

easily manageable; their agitation and their aggressive behavior subsided. Hallucinations were reduced, lost their emotional charge, occasionally even disappeared. The same applies to paranoid ideas. Obsessive thinking also lost its force, and compulsive activity disappeared.

The development of this improvement sometimes became manifest after an interval of several weeks or months. In the intermediary stage, repressed symptoms, such as hostility or increased libido, may become manifest for a while.

Thirty-five patients in Groups 2 and 3 (extensive lesions of the dorsomedial nuclei) were observed for periods varying from four months to over two years. Of these 35 patients, 5 returned home with nearly full working capacity; 12 were discharged with diminished working capacity; 8 were more manageable in the hospital; 10 are unchanged, and 8 have relapsed.

Particularly in schizophrenic patients, the duration of the disease is an important factor in the success or failure of the operation. The ratio of improved to unimproved patients was 8:5 for schizophrenic persons whose disease had lasted less than five years. This ratio was 4:9 when the schizophrenia had lasted five years or longer.

Relapse may have various causes, partly psychologic, such as increase of the stress to which the patient is subjected after leaving the protective atmosphere of the hospital and returning to daily life, and partly anatomic-physiologic. Our main goal in the first part of our work was to ascertain the minimum lesion that would produce a therapeutic effect. We were therefore satisfied in Group 2 to place 5 small lesions affecting about one-seventh of the volume of the dorsomedial nuclei. However, after placing larger lesions (3 layers of rosettes in each dorsomedial nucleus) we also observed some relapses. In analyzing their development the following facts must be borne in mind: It is rather improbable that the neural mechanism of a complex function like emotion is limited to a single system, such as the connections between the dorsomedial nucleus of the thalamus and the frontal association areas, and it seems rather probable that other systems may participate in this mechanism. One should consider the possibility that particularly hypothalamic connections with the frontal lobes, perhaps by way of the septum, or those with areas on the orbital surface shown by strychnine neuronographic study (Ward and McCulloch [4]) may play a part in this mechanism, besides the connections of the dorsomedial nucleus with the frontal association areas. One has, therefore, to bear in mind the possibility that even after large lesions of the dorsomedial nuclei have been produced compensatory mechanisms may take place, and that the development of such compensation may be one of the causes of relapse.

Animal experiments particularly induced us to place lesions in the subthalamus and the hypothalamus in patients who relapsed after initial improvement brought about by dorsomedial thalamotomy or in whom this procedure proved insufficient. In the experiments of Spiegel and Miller,[5] subthalamic lesions in cats produced transient somnolence and catalepsy, and the animals were less excitable than before operation. In monkeys, Ranson[6] observed, after bilateral lesions had been placed in the lateral hypothalamic areas, the emotional reactions decreased.

In 7 schizophrenic patients we placed 1 to 3 electrocoagulations through 1 puncture canal in the lateral hypothalamic area and the overlying subthalamus. The first case of this type may be briefly described. The patient was an agitated, hallucinating schizophrenic who had improved to such an extent after the first thalamotomy that he could be considered nearly normal. One and a half years after the operation he relapsed, again had hallucinations and had to be readmitted because of his catatonic excitement. Since a second thalamotomy increasing the lesion of the dorsomedial nuclei failed to change his condition, it was decided to place a small lesion on either side of the posterior hypothalamus in a two-stage operation. After this procedure he quieted down, had no further hallucinations and became easily manageable. Although he still showed schizophrenic traits, such as laughing inappropriately, he could be discharged from the hospital, and his parents are now trying to readjust him on a farm.

In a second agitated, hallucinative schizophrenic it was also necessary to add bilateral hypothalamic lesions to those of the dorso-

medial nuclei. In 5 other cases the addition of unilateral (right) hypothalamotomy to the bilateral dorsomedial thalamotomy seemed sufficient. In 1 of these 5 cases the bilateral dorsomedial thalamotomy was combined with right hypothalamotomy in a one-stage operation. These combined operations relieved the patients from anxiety, emotional overexcitability and agitation, so that they became quiet and more easily manageable. A second patient could be sent home. For the others the time of observation is too short to arrive at a definite conclusion.

The effects of these hypothalamic punctures upon the vegetative system were surprisingly slight. There was in all cases a transitory rise in temperature lasting from one or two days to more than a week. In some instances there were slight anisocoria, detectable in diffuse light only, and a transitory slight vasodilation in the opposite limbs revealed by a slight increase of cutaneous temperature on the opposite side. In contrast to Ranson's monkeys, which refused food and were nauseated after the production of bilateral hypothalamic lesions, most of our patients showed an excellent appetite a few days after the operation. Only 1 was nauseated. Transient polydipsia and polyuria appeared in 2 cases. Somnolence was marked for a few days to more than a week in all cases, and in 1 patient there was a transitory state of catalepsy.

Since our longest observation period after hypothalamotomy is five months, a discussion of long-lasting undesirable side effects is limited to those cases in which only dorsomedial thalamotomy was performed. In 4 cases there were defects of memory lasting for several months and in 3 a diminution of initiative. One of these patients had been previously subjected to prefrontal lobotomy at another hospital. This patient is also more careless in personal appearance.

The data obtained by applying the Wechsler-Bellevue Intelligence Scale to 16 persons before and after dorsomedial thalamotomy, to 3 before and after mesencephalotomy and to 3 before and after paracommissural thalamotomy within one to three weeks and three months after operation were analyzed by Miss R. Koch.

Analysis showed that the differences in mean achievement before and after operation in subtest scores, verbal I.Q., performance I.Q. and full scale I.Q. are statistically insignificant and should be attributed to chance factors or sampling variations. As regards the results in individual cases, the full scale I.Q. dropped in 3 patients in the first postoperative test but recovered in the second or third; 1 schizophrenic patient showed a decline that was more pronounced in the second than in the first postoperative test, apparently owing to progress of the basic disease. A marked increase of the total I.Q., e.g., in an obsessive compulsive neurotic patient with an I.Q. of 85 to 105 in the second postoperative test, may be due to the fact that such a patient becomes better able to concentrate on the task if he is no longer dominated by fears or obsessive thinking.

One of the main objections raised against psychosurgery is the pronounced personality change, which has been described by the statement that the patient "loses his soul." It would seem that one of the chief advantages of thalamotomy is that relief from emotional disorders may be obtained, and that most of the undesirable personality changes following prefrontal lobotomy, such as distraction, childishness, facetiousness, lack of tact or control, profanity and outbursts of temper, do not appear.

The method seems to have the further advantage that only a minimum scarring of the cortex is produced by introducing a thin electrode. This is in contrast with the extensive scars in the cortex and white matter produced by the various types of operation on the frontal lobe, which lead to epileptiform convulsions in a rather high percentage of the patients. In our material, Jacksonian convulsions appeared only once in 1 case, in which bilateral dorsomedial thalamotomy and hypothalamotomy had been performed. Several months after the last operation, a suppurative infection of the upper lid of the left eye developed. During this illness a right-sided seizure of clonic convulsions appeared. A definite relation of this suppuration to the operation could not be established.

The electroencephalograms taken at intervals varying from fifteen minutes up to nearly

two years after operation failed to show signs of an increased convulsive reactivity. In many instances there were no significant postoperative changes of the rhythm. In some cases, after extensive lesions of the dorsomedial nuclei or after combination of such lesions with hypothalamotomy there developed a slowing, particularly in the frontal leads, which subsided within a few weeks. This confirms experiments on cats (Spiegel,[7] Bremer [8]), showing that α activity may still appear in the electrocorticogram if the circuits between the frontal association areas and the thalamus are interrupted.

II. MESENCEPHALOTOMY AND MESENCEPHALOTHALAMOTOMY FOR RELIEF OF PAIN

For the treatment of persistent pain by interruption of the central pain-conducting pathways, the region of the superior colliculi is of particular interest. A relatively small lesion here can interrupt the spinothalamic system as well as the main part of the pain-conducting secondary trigeminal tracts. However, the usual technic of exposure of the midbrain by elevation of the caudal part of the cerebrum as carried out, for instance, by Walker[9] for mesencephalic tractotomy sometimes may cause considerable damage to the occipital lobe even in the hands of the most skillful neurosurgeon. By means of the stereotaxic technic developed by us this region may be reached easily, without the necessity of elevating the cerebrum.

It should be emphasized, however, that the smallness of the area covered by these pain-conducting pathways requires extremely exact application of the stereoencephalotome at the preoperative roentgen study as well as during operation, in order that these systems may not be missed. Furthermore, if the pineal gland is not sufficiently calcified and its center cannot be exactly determined, air encephalographic study is advisable so that the computation can be made from other points, e.g., the posterior commissure.

In the first group (3 cases) lesions of the pain-conducting pathways in the midbrain were combined with lesions of the dorsomedial nucleus of the thalamus (mesencephalothalamotomy). Since lesions of the long pain-conducting systems (such as the spinothalamic tract) may leave accessory pathways intact, the thalamic lesions were added to the mesencephalotomy in the hope that the thalamic lesions would produce a state of indifference to residual pain, similar to that observed by Freeman and Watts[10] after prefrontal lobotomy.

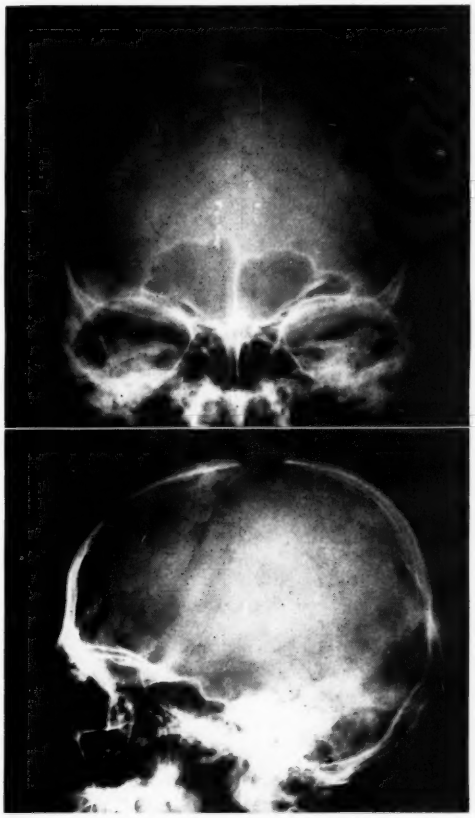

Fig. 3.—Postoperative roentgenogram showing pantopaque shadow at site of thalamic lesion. *Above*, anteroposterior view; *below*, lateral view.

The patients in 2 of these 3 cases suffered from tic douloureux, which was unrelieved by retrogasserian rhizotomy performed by other neurosurgeons. In the first case the pain disappeared after contralateral mesencephalothalotomy except for occasional paresthesia around the right eye.* In the second case the

*A detailed description of this case has appeared in **Surgery**. 27:115, 1950.

contralateral mesencephalothalomotomy resulted in considerable relief of pain, and the patient did not need narcotics any longer. Interruption of the pathway conducting pain impulses of course produced hemialgesia on the opposite side; it was, however, only transitory in the first case.

We were particularly interested to learn whether the addition of the thalamic lesion to that in the midbrain produced a state of indifference to pain transmitted by fibers that had escaped the mesencephalic lesion. In this respect the third case yielded valuable information.

The patient suffered from severe diffuse burning pain of the right lower extremity following spinal trauma. Several disc operations, bilateral chordotomies, rhizotomy, lumbar sympathectomy and intraspinal alcohol had failed to relieve her. Bilateral extensive lesions of the dorsomedial nuclei were combined with mesencephalotomy, which apparently only partially injured the spinothalamic systems, since the sensory conditions were essentially unchanged. After this operation the patient presented first a picture of confusion, particularly of disorientation for time and memory defects. During this stage she was rather indifferent to pain and did not complain about it. When asked about the pain she admitted that there was still an area of pain around the buttocks, but she said "I do not feel like yelling." After the state of confusion had subsided she again complained spontaneously about this pain, but the painful area had receded from the entire leg to an area around the right buttock and she no longer required narcotics, while before operation it had been necessary to give her 100 mg. of demerol and 30 mg. of pantopon every three hours. After a period of three months her pain returned to the same degree and extent as before operation. Therefore bilateral mesencephalotomy was repeated. After this operation the area of analgesia that had been produced by the chordotomies was increased from the level of T4 to that of C3, showing that the spinothalamic systems were injured bilaterally. After this procedure the pain was again reduced to an area limited to the right buttock.

In this patient, extensive bilateral lesions of the dorsomedial nuclei resulted in a transitory state of confusion, temporal disorientation and memory defects accompanied by a definite slowing on the electroencephalogram. During this state of confusion her reaction to pain was somewhat similar to that observed by Freeman and Watts after bilateral prefrontal lobotomy. However, when the state of confusion subsided she complained of her pain as much as before operation, and her attention to the pain had apparently returned to the preoperative level.

It seems, therefore, that extensive bilateral lesions of the dorsomedial nucleus produce only a transient state of indifference to pain. We decided, therefore, in the following group of cases to limit the operation to lesions of the pain-conducting pathways in the midbrain (mesencephalotomy).

This second group comprises 2 cases of inoperable carcinoma of the uterus, 1 of inoperable carcinoma of the urinary bladder and 1 of pain in the lower part of the back. This fourth patient had not been relieved by a lumbar laminectomy and a high cervical chordotomy performed by two other surgeons. The latter operation left the patient with a severe burning pain of the entire right lower extremity.

The experiences with bilateral mesencephalotomy in this second group seem to indicate that lesions limited to the pain-conducting pathways in the midbrain without thalamic lesions may be able at least to reduce pain sufficiently to make the condition tolerable. The omission of thalamic lesions has the advantage that one produces a smaller lesion and that the transitory state of disorientation for time and the transient memory defects are avoided.

Compared with spinal anterolateral chordotomy, mesencephalotomy is followed by fewer undesirable side effects. According to Sjöqvist,[11] disturbances of vesical function, sexual function and blood pressure almost invariably accompany transection of the anterolateral tracts in the spinal cord. Besides, this operation not infrequently produces paralyses due to encroachment of the lesion upon the pyramidal tract. In the midbrain the spinothalamic and quintothalamic tracts lie close to the medial aspect of the arm of the inferior colliculus that carries auditory impulses to the cerebral cortex. Lesions of this system

may induce impairment of hearing, chiefly on the opposite side, and transitory tinnitus in the opposite ear. It seems advisable, therefore to avoid extension of the lesion too far in the lateral direction, lest the arm of the inferior colliculus be injured. By puncturing the pain-conducting systems from a dorsal direction one may avoid lesions of this part of the auditory system more easily than by mesencephalic tractotomy, since in the latter operation the lateral surface of the midbrain is incised.

Our material has not been observed long enough to enable us to judge the "permanent" results of mesencephalotomy. The patient in Case 1 (facial neuralgia) is still free of pain two years after the operation. However, one must bear in mind that, as after anterolateral chordotomy also following lesions of the spinothalamic and quintothalamic tracts in the midbrain, in some cases the pain may recur and paresthesias may appear in the analgesic or hypoalgesic area.

Mesencephalotomy seems to be indicated particularly in cases of facial pain unrelieved by other conservative and operative procedures, and also in cases of unbearable pain in the arm and chest, since the spinothalamic fibers corresponding to these regions reach the surface, after crossing the midline, in the uppermost cervical segments or in the medulla oblongata, where interruption of this system is more hazardous than in the midbrain.

III. STUDY AND TREATMENT OF CONVULSIVE DISORDERS OF SUBCORTICAL ORIGIN

The stereotaxic method permits one to approach the question whether certain types of convulsive disorders, such as petit mal, characterized by the spike and dome pattern in the electroencephalogram, may have a subcortical origin. In cases of grand mal and petit mal, the electrical discharges from the thalamus were recorded during operation (electrothalamogram) by means of needle electrodes introduced by the stereoencephalotome. In the electrothalamograms recorded with the patient under general anesthesia, spike discharges were found which remained limited to the thalamic leads, while the electro-corticogram recorded by scalp electrodes failed to show abnormal discharges[12]). When the electrical discharges were recorded with the patient under local anesthesia, a propagation of the seizure discharges from the thalamus to the cortex could be seen. The seizure discharges first appeared in the thalamus; then these abnormal thalamic discharges were accompanied by similar ones in the frontal leads, and finally the thalamic seizure discharges outlasted those in the frontal lobe. These seizure discharges are not limited to the region of the internal lamina medullaris, on stimulation of which Jasper[13] was able to elicit spike and dome patterns in the electroencephalograms of cats, but they may reach a maximum in distant parts, such as the more dorsal areas of the thalamus.

Our electrographic observations encouraged us to place lesions in dorsomedial areas of the thalamus in patients suffering from grand mal and petit mal, with predominance of the latter type of seizures, in the hope of influencing the latter component. Our experiences with the latter operation (3 cases in which the condition was refractory to the usual medication) are too small to afford definite conclusions as to the results of this procedure. We have not yet succeeded in abolishing the petit mal seizures completely; however, in at least 1 of these 3 cases there was a definite diminution of the number of attacks, the severity of associated motor phenomena (facial twitching, shaking of the head) and the disturbance of consciousness. Our experiences seem to justify the conclusion that in petit mal, at least in a certain group of cases, a subcortical component plays a part; however, relatively large areas of the thalamus seem to be affected, so that lesions of relatively large parts of this ganglion would be necessary to abolish petit mal seizures completely.

SUMMARY

The authors present the results of their experience with stereoencephalotomy in psychosurgical therapy, in the treatment of intolerable pain and in the study and treatment of convulsive disorders. Their technic for carrying out therapeutic procedures in the depth of the brain is described. The opinion is expressed that stereoencephalotomy may permit one not only to obtain new information regarding the physiopathology of subcortical areas

in man but to find new methods for treatment of pathologic conditions related to the brain stem.

RÉSUMÉ

Les auteurs présentent les résultats de leur expérience avec la stéréoencephalotomie dans la thérapie psychochirurgicale, pour le traitement de douleurs intolérables et pour l'étude et le traitement de certains troubles convulsifs. La technique qu'ils emploient pour le traitement thérapeutique dans la profondeur du cerveau est décrite. Ils experiment l'opinion que la stéréoencephalotomie offre de grands avantages dans les recherches et le traitement des conditions pathologiques du cerveau.

ZUSAMMENFASSUNG

Die Verfasser stellen die Ergebnisse ihrer Erfahrung mit der Stereoencephalotomie in der chirurgischen Behandlung von Psychosen, in der Behandlung unertraeglicher Schmerzen und in der Erforschung und Behandlung gewisser Krampfzustaende dar. Sie beschreiben ihre Technik in der Ausfuehrung therapeutischer Eingriffe in der Tiefe des Gehirns. Sie sind der Meinung, dass die Stereoencephalotomie grosse Vorteile bietet in der Erforschung und Behandlung pathologischer Zustaende im Hirnstamm.

RIASSUNTO

Gli AA. riferiscono i loro risultati con la stereoencefalotomia nella terapia psicochirurgica, nell'attenuazione di dolori intollerabili, e nella cura di talune sindromi convulsive. Dopo avere illustrato la tecnica di questo nuovo genere di operazioni cerebrali, gli AA. giungono alla conclusione che la stereoencefalotomia offre dei grandi vantaggi sia dal punto di vista della ricerca scientifica, che della terapia.

RESUMEN

Los autores presentan los resultados de su experiencia con la estereoencéfalotomía en la terapia psicoquirúrgica en el tratamiento del dolor intratable y en el estudio y tratamiento de ciertos trastornos convulsivos. Describen su técnica para llevar a cabo procedimientos terapéuticos en la profundidad del cerebro, expresando el criterio de que la estereoencefalotomí tiene grandes ventajas para la investigación y tratamiento de los procesos patológicos del neuroeje.

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Nothing will sustain you more potently than the power to recognize in your humdrum routine, as perhaps it may be thought, the true poetry of life—the poetry of the commonplace, of the ordinary man, of the plain, toil-worn woman, with their love and their joys, their sorrows and their griefs.—*Sir William Osler*

A New Approach to the Treatment of Subcapital and Transcervical Fractures of the Hip

Preliminary Report

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ANY method that bears promise of success in the treatment of subcapital and transcervical fractures of the hip is worthy of mention. I initiated the use of a one-piece flanged hip nail for fractures about the trochanteric region, and I have been using this same nail for hip fractures proximal to this area for about a year and half. The results to date are, of course, inconclusive, but they are most promising.

The following cardinal points justify use of this nail in treatment of subcapital and transcervical fractures of the neck of the femur:

1. It is most important to have absolute immobilization of the nail at its entrance into the thin subtrochanteric cortex. A rigid flange attached to the femoral shaft by at least two screws is the minimum means of achieving this stabilization. Any motion at this point will result in a "whip" action of the nail in the spongy bone of the femoral neck and head, with resulting motion between the proximal and the distal fragment.

2. Some absorption, with shortening of the neck, always results whether union takes place or not.

3. As the neck shortens, a Smith-Peterson nail or lag screw must move along either the proximal or the distal fragment (medially or laterally), unless the fragments remain separated. If laterally, the head must protrude outside the cortex with motion at this point. Any motion here must give rise to motion at the fracture site unless solid union is present.

4. As the femoral neck shortens during healing, the nail here recommended must traverse the capital fragment in a medial direction and often enters the joint cavity. No damage results if the weight-bearing surfaces of the head and acetabulum are not invaded.

Figure 1 shows the weight-bearing surface, which is easily seen in every roentgen film of a hip joint; also are seen the two safety zones just above and below the fovea capitis. Of course, as the hip is abducted and adducted the weight-bearing surface of the head of the femur will change, but that of the acetabulum remains constant. These safety zones should be carefully noted with the patient's leg slightly abducted in the normal walking alignment angle.

5. If the nail is close to the anterior surface of the neck, the ligamentum teres probably

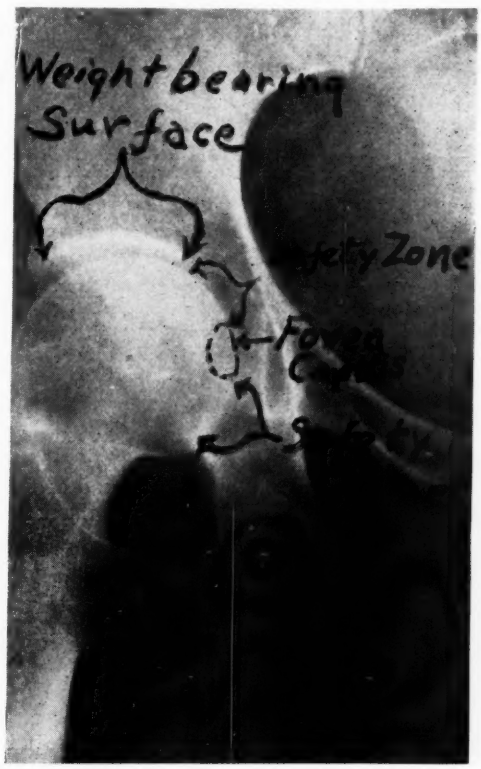

Fig. 1.—Weight-bearing surface of acetabulum and the two "safety zones" above and below the fovea.

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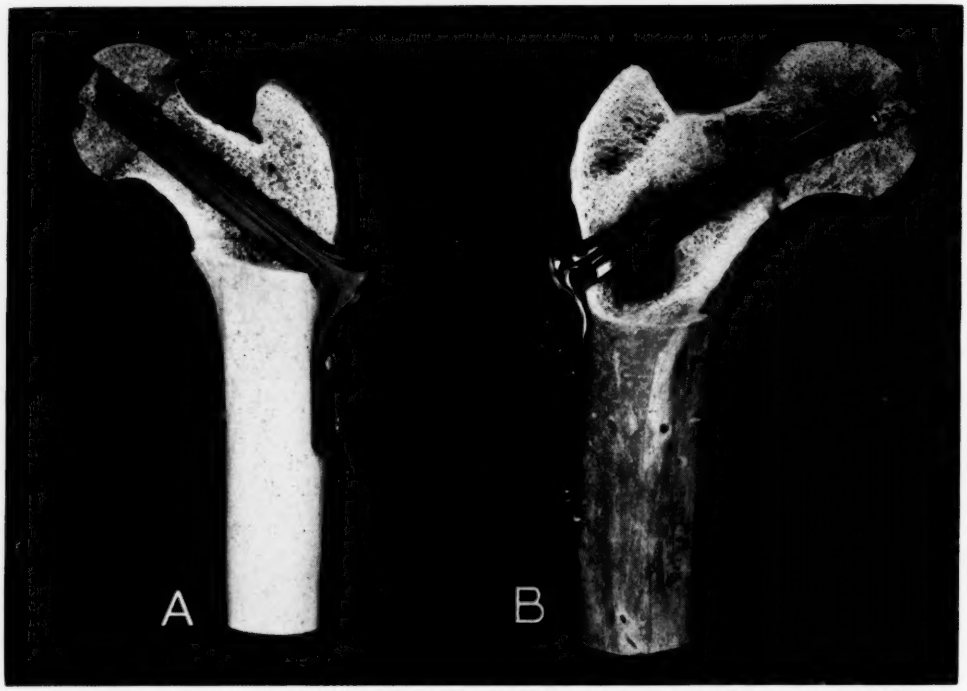

Fig. 2.—*A*, nail in place for subcapital fracture, going just above the fovea and still below the weight-bearing surface of the head. *B*, nail in place for transcervical fracture similar in position to that shown in Figure 2*A*.

will not be injured even if the nail pierces the head on the rim of the fovea. It is better to have the nail just above or below the fovea if possible.

Figure 2 shows the nail correctly placed for a transcervical and a subcapital fracture respectively, with the end of the nail aimed just above the fovea.

Figure 3 is an end view of the head of the femur, with the nail in the middle of the neck, centered just below the fovea.

Of 8 femoral heads studied, this slightly posterior position of the fovea was present in each to a greater or less degree.

6. A 130-degree nail, generally, can be directed just above the fovea and a 120-degree nail just below it. It is always better to have a little more valgus than normal and never to create varus when attaching the flange to the femoral shaft by screws. The more nearly the nail makes a right angle with the fracture site, the less chance there is of a "shearing" action and the better the prospect of union.

7. If the nail penetrates the head and even encroaches into the acetabulum in a non-weight-bearing area, no harm will result if hip motion is kept to a minimum without pain, muscle spasm, grating or weight bearing during the healing period. When solid union is present, the nail must be removed and weight bearing, with increasing range of motion, should be permitted.

The following manipulative, operative and postoperative points should be kept in mind:

(*a*) Accurate reduction of the fracture should be accomplished by the Ledbetter technic, with good anteroposterior and lateral roentgenograms.

(*b*) The so-called "beak" of the lower part of the femoral neck is often broken during reduction by the Ledbetter maneuver. The need for open correction and osteotomy of the

"beak" is questioned.

(*c*) If the head fragment is held rigid by three guide wires or pins while the nail is driven in over one of these, rotation and slipping of the proximal fragment will be prevented, especially if the head fragment is small.

(*d*) The driving in of the nail impacts the fragments sufficiently.

(*e*) Early ambulation with crutches or walker may be allowed, but no full weight bearing is permissible until solid union is demonstrable by roentgenogram (four to six months usually).

Figure 4 and the remaining illustrations furnish roentgen evidence of satisfactory healing. The 12 cases are consecutive. Since this series was completed I have operated on 2 more fractures of the transcervical vertical type, but at the time of writing they are only a week or so old. However, reduction and maintenance of reduction in each case are excellent.

COMMENT

Of course, it is too early to form any definite opinion about this method of treating subcapital and transcervical fractures of the neck of the femur, whether of the valgus or the much more troublesome varus or vertical type, but the roentgenograms here presented speak for themselves. The excellent work done by F. Pauwels, Van Gorder, James Dickson, Bosworth, Cleveland, Neer, McLaughlin and many others has brought out the hazardous prognosis in certain types of the aforedescribed fractures. The patients whose roentgenograms are shown in this paper represent a consecutive series, and as yet I have encountered no instance of nonunion.

A few patients have had the nails removed, with no ill effects up to the time of writing. Others, I am sure, will have the nail removed later. In the meantime they are ambulatory with crutches or a walker but are not bearing any real weight and are not moving the involved hip when they have pain, muscle spasm, limitation of motion or grating.

SUMMARY

In the last one and one-half years 14 consecutive hips with transcervical and subcapital fractures have been treated by using my nail with two or more screws attaching the flange to the femoral shaft. The 14 patients represent about 25 per cent of the 54 patients with fractures of the femoral neck or the trochanteric area on whom I have operated during this period. The reasons for using this method and the facts that explain its good points are enumerated, and the roentgenograms of this series of patients are presented. It is too early to form any definite opinion about the method for such fractures, but so far the results are highly encouraging.

Fig. 3.—End view of head of femur with nail in middle of neck, centered just below fovea.

Fig. 4.—Patient K. G. Pre-reduction (*upper left*) and nine months postoperative roentgenograms, AP and lateral.

CLOU À UN REBORD POUR LES FRACTURES DE LA TETE ET DU COL DU FEMUR: RAPPORT PRÉLIMINAIRE

Toute méthode permettant quelques chances de succès dans le traitement des fractures de la tête fémorale et dans celles du col du fémur mérite d'être étudiée. J'ai initié l'emploi du clou à un rebord pour les fractures intéressant la région trochantérique. J'emploie depuis 18 mois ce même clou pour les fractures de cette région de la hanche. Les résultats jusqu'a présent, naturellement, ne sont pas conclusifs, néanmoins ils sont très encourageants.

Les considérations suivantes justifient l'emploi de ce clou dans le traitement des fractures de la tête du femur et dans celles du col de cet os.

1. Il importe d'obtenir l'immobilisation absolue du clou à son entrée dans la couche corticale soustrochantérique. Un rebord rigide attaché au col du femur par deux vis, est le moyen minimum pour obtenir cette stabilisation. Toute motion à ce point produira un mouvement du clou dans la partie spongieuse du col et de la tête du femur. Il en resultera un mouvement entre les fragments proches et les fragments eloignés.

2. Quelque absorption et quelque raccourcissement du col, résulte toujours qu'il y ait union ou non.

3. Avec le raccourcissement du col fémoral, le clou Smith-Petersen ira entre ou dans le fragment proximal ou dans le fragment distal (médiallement ou latéralement), à moins que

le fragment reste separé. Si ce mouvement est latéral, la tête sortira du cortex et il y aura motion à ce point. Tout mouvement à ce point produira un mouvement au siège de la fracture à moins qu'une union solide soit presente.

4. Durant la guérison, le col femoral se raccourcit. Le clou de Jewett traverse le fragment de la tête dans une direction médiale et souvent pénètre dans la cavité articulaire. Il n'en résulte aucun mauvais résultat si les surfaces de la tête et de l'acétabule qui portent le poids, ne sont pas envahies. Le dessein numero I, nous indique la surface qui porte la poids du corps. Cette surface est distincte dans tous les films radioagraphiques de l'articulation de la hanche; on peut voir aussi les deux zones de sureté immédiatement au-dessus et immédiatement au-dessous de la "fauvette capitis." Naturellement, s'il y a abduction ou adduction de la hanche, la surface de la tête du fémur qui supporte le poids de la hanche change, celle de l'acétabule est constante. Ces zones de sûreté doivent être soigneusement observées avec le membre du malade légèrement éloigné latéralement de l'angle normal present dans la marche.

5. Si le clou ést proche de la surface interieure du col, le ligament droit probablement ne sera pas lésé même si le clou perce le bord de la tête proche de la "fauvette capitis." Il est mieux que le clou soit légèrement au dessus ou au-dessous de la fauvette.

Le dessin numero 2 nous le clou placé correctement pour une fracture transcervicale ou subcapitale respectivement, avec le clou dirigé juste au-dessus de la fauvette.

Le dessin numero 3 est une vue de l'extremité de la tête du femur ayant le clou situé au-dessous de la fauvette du col.

Des huit cas etudiés, cette position, lègèrement en arrière de la fauvette était presente dans un degre plus ou moins grand.

6. Un clou de 130 degres peut généralement être dirigé au-dessus de la fauvette et un de 120 degrès, juste plus bas que la fauvette. Il est préférable d'avoir toujours un valgus au-dessus de la normale et de ne pas créer un varusquand on attache le rebord à l'aide de vis au corps du fémur. Le plus le clou forme un angle droit avec le siège de la fracture, le moins probable qu'il y ait d'usure par frottement et le meilleur est le pronostic

Fig. 5.—Patient L. B. Roentgenograms taken five months after operation (no satisfactory preoperative films available).

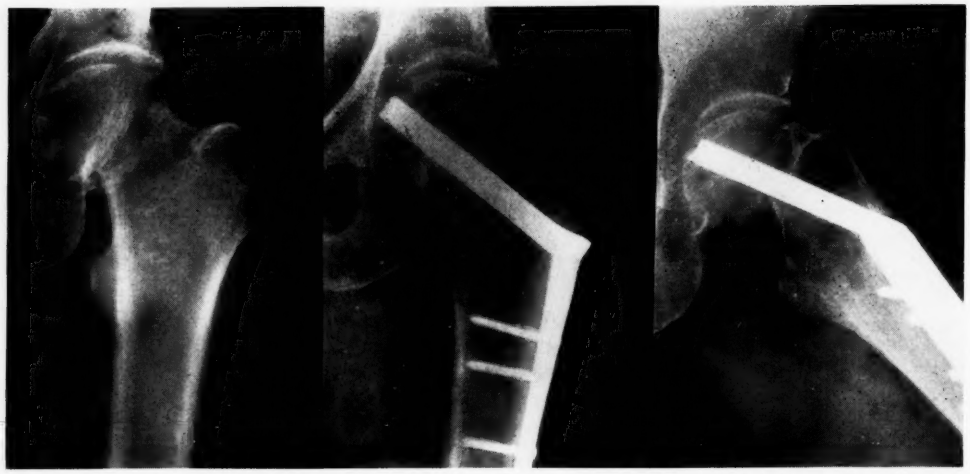

Fig. 6.—Patient C. L. V. V. AP view taken on day of injury (*extreme left*) and AP and lateral views taken four months after operation. There is some cystic degeneration of the femoral head. No weight bearing as yet. Union is progressing.

pour l'union.

7. Si le clou pénètre la tête ou pénètre dans l'acétabule dans une région qui ne porte pas le poids du corps, aucune infirmité ne résultera si le mouvement de la hanche est maintenu dans le minimum sans douleurs, sans spasmes musculaires, sans frottement et ne supporte aucun poids durant la période de guérison. Quand l'union solide a été obtenue, le clou peut être enlevé et le poids du corps peut etre autorisé ainsè qu'un une augmentation graduelle de motion.

Les considérations manipulatives, opératoires et postopératoires suïvantes seront observées:

a. La reduction exacte de la fracture par la technique de Ledbetter à l'aide de bons roentgenogrammes anterio-posterieures et latéraux.

b. La projection de la partie inférieuré du col du fémur par la manoeuvre de Ledbetter. Le besoin d'une correction ouverte et d'ostéotomie de cette projection n'est pas approuvée par beaucoup.

c. Si le fragment de la tête est maintenu rigide par trois fils de fer ou épingles pendant que le clou est inséré au-dessus d'une de ces epingles, la rotation et le croissement du fragment proximal sont empechés surtout si le fragment détaché est petit.

d. L'insertion du clou entasse les fragments suffisamment. L'ambulation précoce avec bequilles ou canne peut être permise mais aucun poids n'est permissible, à moins que l'existence d'une solide union soit demontrée par le roentgenogramme.

e. Dans le dessin numero 4, il y a évidence, à l'aide de rayons X, de guérison satisfaisante. Les 12 cas sont consécutifs. Depuis que cette serie est achevée, j'ai opéré 2 fractures transcervicales du type vertical, mais il n'y a qu'une semaine ou deux écoulées au moment de cette revue. La réduction et le maintien de la réduction de chacun de ces cas sont excellents.

COMMENTAIRE

Naturellement, il est trop tôt pour former une opinion définie sur cette méthode de traitement des fractures sous-capitales et transcervicales du col du femur, qu'elles soient du type valgus, ou du type varus qui est beaucoup plus compliqué ou du type vertical, máis les roentgenogrammes párlent pour eux-mêmes.

L'excellent travail fait par F. Pawells, Van Gorder, James Dickson, Bosworth, Cleveland, Neer, McLaughlin et beaucoup d'autres, nous

ont demontré le pronostic habardeux de certains types des fractures ci-dessus mentionnées.

Les malades dont les roentgénogrammes accompagnent cet article représentent une serie consecutive, et jusqu'a présent, je n'ai rencontré aucun cas de non-union; chez plusieurs malades, ou a enlevé le clous sans effets nocifs, jusqu'a present.

Dans les autres cas, j'en suis sûr, on enlèvera le clou plus tard. Pour le moment, les malades sont ambulatoires avec bequilles ou cannes mais ne soumettent la jointure à aucun poids. On ne soumettra la hanche attaquée à aucun mouvement en presence de spasmes musculaires, de douleurs, de limitation de motion ou de grattement.

GEFLANSCHTER NAGEL AUS EINEM STUECK ZUR BEHANDLUNG SUBKAPITALER UND TRANSZERVIKALER OBERSCHENKELBRUECHE

Vorlaeufiger Bericht

Jede erfolgversprechende Methode der Behandlung subkapitaler und transzervikaler Oberschenkelbrueche verdient berichtet zu werden. Ich habe die Anwendung eines geflanschten Hueftnagels aus einem Stueck zur Behandlung von Bruechen in der Trochantergegend eingefuehrt und habe seit etwa 1½ Jahren denselben Nagel in Hueftbruechen, die proximal von dieser Gegend gelegen waren, benuetzt. Die bisherigen Resultate erlauben natuerlich noch keine Schluesse, sind aber doch sehr ermutigend. Die folgenden wesentlichen Punkte rechtfertigen die Anwendung dieses Nagels in der Behandlung subkapitaler und transzervikaler Brueche des Schenkelhalses:

1. Es ist wichtig, eine absolute Unbeweglichkeit des Nagels an der Eintrittsstelle in die duenne Knochenrinde der subtrochantaeren Gegend zu erzielen. Ein starrer Flansch, der mit mindestens zwei Schrauben am Oberschenkelschaft befestigt wird, ist das einfachste Mittel, eine solche Stabilisierung zu erzielen. Jede Bewegung an diesem Punkte muss zu einer "Peitschen"-Aktion des Nagels in dem schwammigen Knochen des Oberschenkelhalses und-kopfes und schliesslich zur Verschieblichkeit der proximalen und distalen Bruchstuecke gegeneinander fuehren.

2. Ein gewisser Grad von Absorption mit Kuerzung des Halses erfolgt immer, gleichgueltig ob eine Verschmelzung der Bruchstuecke eintritt oder nicht.

3. Im Verlauf der Kuerzung des Halses muss ein Smith-Peterson-Nagel oder eine Schraube sich entweder mit dem proximalen oder dem distalen Bruchstueck (medial oder lateral) mitbewegen, es sei denn, dass die Fragmente voneinander getrennt bleiben. Erfolgt die Bewegung lateral, so muss der Kopf ueber die Knochenrinde hinausragen und an dieser Stelle Beweglichkeit zeigen. Jede Bewegung an diesem Punkt muss zur Bewegung an der Bruchstelle fuehren, es sei denn, dass eine starre Verschmelzung stattgefunden hat.

4. Der Jewettnagel muss, wenn der Schenkelhals sich waehrend der Heilung verkuerzt, das Kopffragment in medialer Richtung durchdringen, und haeufig bricht er in die Gelenkhoehle ein. Solange die Tragflaechen des Kopfes und des Azetabulums nicht in Mitleidenschaft gezogen sind, entsteht dadurch kein Schaden.

Abbildung 1 zeigt die Tragflaeche, wie sie mit Leichtigkeit auf jedem Roentgenbild des Hueftgelenks erkannt werden kann; ausserdem sieht man die beiden Sicherheitszonen oberhalb und unterhalb der Fovea capitis. Die Tragflaeche des Oberschenkelkopfes veraendert sich natuerlich mit der Abduktion und Adduktion, waehrend die des Azetabulums unveraendert bleibt. Diese Sicherheitszonen muessen, waehrend das Bein des Kranken im normalen Gehwinkel leicht abduziert ist, sorgfaeltig beachtet werden.

5. Ist der Nagel nahe der Vorderwand des Halses gelegen, so hat das Lig. teres wahrscheinlich keine Verletzung erlitten, auch wenn der Nagel den Kopf am Rande der Fovea durchbohrt. Besser ist es, den Nagel, wenn irgend moeglich, knapp oberhalb oder unterhalb der Fovea liegen zu haben.

Abbildung 2 zeigt die richtige Lage des Nagels im Falle einer transzervikalen und einer subkapitalen Fraktur; die Spitze des Nagels zielt auf einen Punkt gerade oberhalb der Fovea.

Abbildung 3 zeigt das Ende des Oberschenkelkopfes mit dem Nagel in der Mitte des Schenkelhalses, ausgerichtet auf die Gegend knapp unterhalb der Fovea.

In acht beobachteten Oberschenkelkoepfen

war diese leicht nach hinten gerichtete Lage der Fovea jedesmal in groesserem oder geringerem Masse vorhanden.

6. Ein Nagel mit einer Winkelung von 130 Grad kann im Allgemeinen auf die Gegend gerade oberhalb der Fovea gerichtet werden und einer mit einer 120 graedigen Winkelung auf die Gegend genau unterhalb der Fovea. Bei der Befestigung des Flansches am Oberschenkelschaft mittels Schrauben ist es immer gut, eine leicht uebernormale Valgusstellung zu erzielen und eine Varusstellung unter allen Umstaenden zu vermeiden. Je mehr sich der Winkel zwischen dem Nagel und der Bruchlinie einem rechten Winkel naehert, je geringer ist die Gefahr, dass es zu einer "Scheren"—Aktion kommt, und um so besser sind die Aussichten fuer eine Heilung.

7. Dass der Nagel den Kopf durchbohrt und sogar das Azetabulum in einer Gegend, die keine Tragflaeche ist, angreift, schadet nichts, wenn waehrend der Heilungsperiode die Huefte so unbeweglich wie moeglich gehalten wird, und wenn Schmerzen, Muskelkraempfe, Reibung und Belastung vermieden werden. Wenn es zu einer knoechernen Vereinigung gekommen ist, muss der Nagel entfernt werden, und Belastung mit wachsender Bewegungsfreiheit kann gestattet werden.

Folgende die Behandlung, die Operation

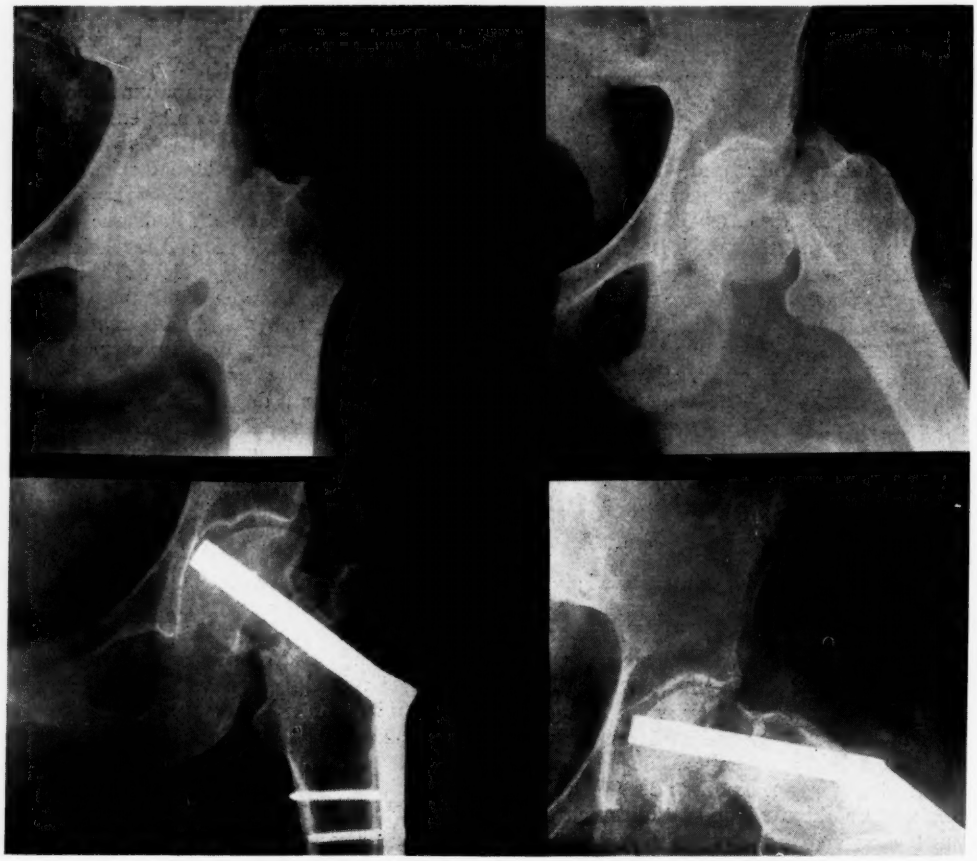

Fig. 7.—Patient E. H. Films taken on day of injury (*upper left*) and four months after operation. Nail to be removed later. Meantime hip is kept painless. No weight bearing.

und die Nachbehandlung betreffenden Punkte sollten beachtet werden:

(a) Sorgfaeltige Einrichtung des Bruches nach der Ledbetterschen Technik mit guten ventrodorsalen und seitlichen Roentgenbildern.

(b) Der sogenannte "Schnabel" der unteren Haelfte des Schenkelhalses wird waehrend des Ledbetterschen Einrichtungsmanoevers haeufig gebrochen. Die Notwendigkeit einer offenen Einrichtung und einer Osteotomie des "Schnabels" wird in Frage gestellt.

(c) Drehung und Verrutschung des proximalen Bruchstuecks kann, besonders wenn das Kopffragment klein ist, verhindert werden, indem das Kopffragment durch drei Fuehrungsdraehte oder-nadeln festgehalten wird, waehrend der Nagel ueber eine von diesen hineingetrieben wird.

(d) Das Hineintreiben des Nagels ergibt eine hinreichende Zusammenpressung der Bruchstuecke.

(e) Fruehzeitige Bewegung an Kruecken oder im Gehapparat kann gestattet werden, dagegen ist eine volle Belastung unzulaessig, bevor eine knoecherne Vereinigung roentgenologisch nachgewiesen werden kann (im allgemeinen vier bis sechs Monate).

Fig. 8.—Patient I. C. Films taken on day of injury (*upper left*) and four months after operation. "Beak" not broken and not interfering with union.

Abbildung 4 und die folgenden zeigen den Roentgennachweis zufriedenstellender Heilung. Die zwoelf Kranken stellen eine ununterbrochene Reihe aufeinanderfolgender Faelle dar. Seit der Beendigung der Serie habe ich zwei weitere Frakturen von transzervikalem vertikalem Typus operiert. Diese sind aber, waehrend diese Zeilen geschrieben werden, erst ungefaehr eine Woche alt. Die Einrichtung und die Erhaltung der Stellung ist in beiden Faellen ausgezeichnet.

ANMERKUNG

Es waere natuerlich verfrueht, sich ueber diese Behandlungsmethode subkapitaler und transzervikaler Schenkelhalsbrueche, seien sie nun vom Valgustypus oder vom (viel schwierigeren) Varus-oder vertikalen Typus, ein endgueltiges Urteil zu bilden. Die Roentgenbilder aber, die hier gezeigt werden, sprechen fuer sich selbst. Die ausgezeichneten Arbeiten von F. Pauwels, Van Gorder, James Dickson, Bosworth, Cleveland, Neer, McLaughlin und vielen anderen haben das prognostische Risiko bei gewissen Typen der oben beschriebenen Brueche hervorgehoben. Die Kranken, deren Roentgenbilder in meiner Arbeit gezeigt werden, stellen eine ununterbrochene Serie dar, und bisher habe ich keinen Fall von Niehtheilung gehabt.

Bei einigen Kranken sind die Naegel entfernt worden, ohne dass nachteilige Folgen bis zu dem Augenblick, wo diese Zeilen geschrieben werden, beobachtet wurden. Ich zweifle nicht, dass weitere Kranke von ihren Naegeln spaeter befreit werden koennen. Inzwischen bewegen sie sich auf Kruecken oder im Gehapparat, ohne das Bein wirklich zu belasten und ohne die befallene Huefte zu bewegen, wenn sie Schmerzen, Muskelkraempfe, Bewegungsbehinderung oder Knirschen aufweisen.

CLAVO DE UNA PIEZA CON REBORDE PARA LAS FRACTURAS SUBCAPITAL Y TRANSCERVICAL DE LA CADERA (Informe preliminar)

Cualquier método que prometa ser un éxito en el tratamiento de las fracturas subcapital

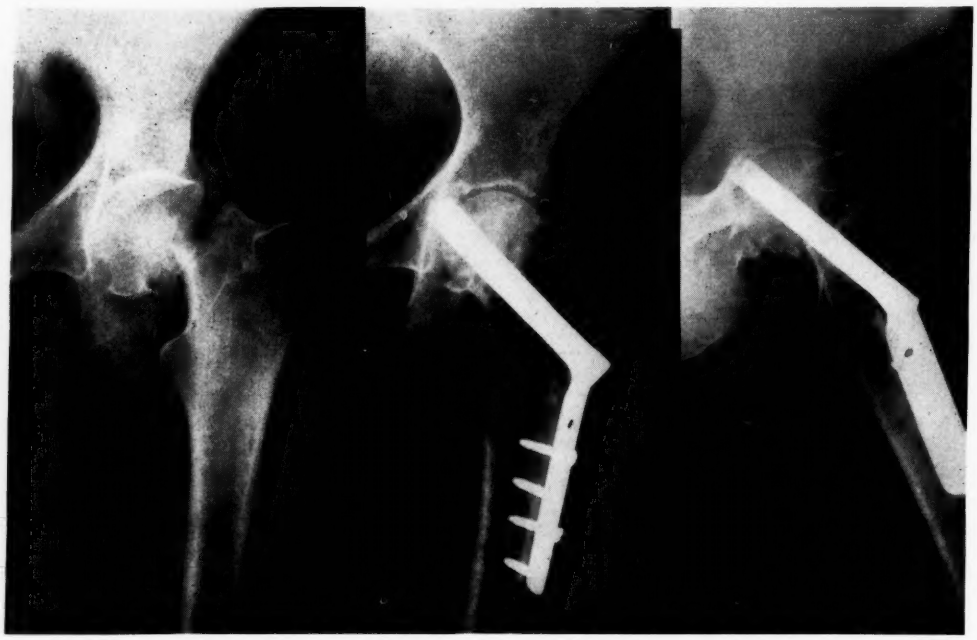

Fig. 9.—Patient I. N. Films taken on day of injury (*extreme left*) and three months after operation. "Beak" broken off during manipulation. Nail removed nine months after operation. Excellent results.

y transcervical de la cadera es digno de mencionarse. He iniciado el uso de un clavo de una pieza con reborde, para la fractura cerca de la región trocantérica y he estado usando este clavo para las fracturas de la cadera próximas a este área durante un año y medio. Los resultados hasta la fecha, por supuesto, no son concluyentes, pero si muy prometedores.

Los siguientes puntos cardinales justifican el uso de este clavo en el tratamiento de las fracturas subcapital y transcervical del cuello del fémur:

1. Es importante la absoluta inmobilización del clavo al entrar dentro del córtex subtrocantérico delgado. Un reborde rígido sujeto al eje femoral por lo menos con dos tornillos, es el modo más sencillo para conseguir esta estabilidad. Cualquier movimiento en este punto resultará en una acción violenta del clavo en el cuello y cabeza femoral con el resultante movimiento entre el fragmento distal y proximal.

2. Ya se consiga unión o no, siempre resulta alguna absorción, con acortamiento del cuello.

3. Al acortarse el cuello, debe moverse un clavo de Smitt-Peterson, o tornillo, a lo largo del fragmento distal o proximal (del centro o lateralmente) a no ser que los fragmentos permanezcan separados. Si se mueve lateralmente, la cabeza debe sobresalir por fuera del córtex con movimiento en este punto. Cualquier movimiento en este punto debe causar movimiento en el lugar de la fractura, a menos que exista una unión sólida.

4. Al acortarse el cuello femoral durante la curación, el clavo de Jewett debe atravesar el fragmento capital en una dirección media, y con frecuencia entra en la cavidad de la articulación. No resulta lesión si no se invaden las superficies que sostienen el peso de la cabeza y del acetábulo.

La figura 1 muestra la superficie que sostiene el peso, que puede verse fácilmente en los rayos X de una articulación de la cadera; también pueden verse las dos áreas de seguridad por encima y por debajo del fóvea capitis. Por supuesto, la abducción y aducción de las superficies que sostienen el peso hace cambiar la cabeza del fémur, pero la del acetábulo permanece fija. Estas zonas de seguridad deben notarse cuidadosamente con la pierna del paciente ligeramente en abducción en ángulo de alineación del andar normal.

5. Si el clavo está cerca de la superficie anterior del cuello, el ligamento del teres probablemente no será lesionado, aún si el clavo atraviesa la cabeza sobre el borde del fóvea. Es mejor tener el clavo si es posible por encima o por debajo del fóvea. La figura 2 muestra el clavo correctamente colocado para una fractura transcervical y subcapital respectivamente, con el extremo del clavo dirigido justamente por encima del fóvea. La figura 3 es una visión final de la cabeza del fémur con el clavo, en el medio del cuello, encontrado justamente por debajo del fóvea. De ocho cabezas femorales estudiadas, esta posición ligeramente posterior del fóvea existía en cada una en mayor o menor grado.

6. Un clavo de 130 grados por lo general puede dirigirse justamente por encima del fóvea y un clavo de 120 grados justamente por debajo. Siempre es mejor tener un poco más valgus que el normal y nunca crear varus cuando se adjunte el reborde al eje femoral por medio de tornillos. Mientras más cercanamente el clavo esté en ángulo recto con el lugar de la fractura, menos chance hay de "separación" y mejor prospecto para la unión.

7. Si el clavo penetra la cabeza y aún se mete dentro del acetábulo en un área que no sostenga peso, no resultará perjuicio alguno si el movimiento de la cadera se conserva al mínimo, sin dolor, espasmo muscular, irritación o sostenimiento de peso durante el período de curación. Cuando exista una unión sólida debe removerse el clavo debiendo permitirse el aguantar peso y el aumento del movimiento. Deben considerarse los siguientes puntos de manipulación, operación y postoperatorios:

(*a*) Reducción exacta de la fractura por la técnica de Ledbetter, con buenas radiografías anterior-posterior y lateral.

(*b*) El llamado "promotorio" de la parte más baja del cuello femoral con frecuencia se fractura durante la reducción por la maniobra de Ledbetter. Se pregunta si hay necesidad de una corrección abierta y de osteotomía del "promotorio."

(*c*) Si el fragmento de la cabeza se mantiene rígido por tres alambres de guía o alfileres mientras que el clavo se dirije sobre

Fig. 10.—Patient F. H. Films taken on day of injury (*upper left*) and three months after operation. "Beak" partially broken off at time of fracture. Union solid. Nail to be removed if it produces any articular symptoms. At present there are none.

uno de éstos se prevendrá la rotación y separación del fragmento proximal, especialmente si el fragmento de la cabeza es pequeño.

(*d*) La introducción del clavo alcanza al fragmento suficientemente.

(*e*) Puede permitirse la ambulación precoz con muletas o andador, pero no está permitido el recargar todo el peso, hasta comprobar por las radiografías que existe una unión sólida (4 a 6 meses, por lo general).

La figura 4 y las ilustraciones restantes ofrecen pruebas radiográficas de la curación satisfactoria. Los 12 casos son consecutivos. Desde que se completó esta serie he operado otras dos fracturas del tipo transcervical vertical, pero al escribir esta comunicación solamente había transcurrido una semana. Sin embargo, la reducción y el mantenimiento de la reducción, en cada caso, es excelente.

COMENTARIO

Es todavía prematuro formar una opinión definitiva sobre este método para el tratamiento de las fracturas subcapital y transcervical del cuello del fémur, ya sean del tipo valgus o del mucho más difícil varus vertical, pero las radiografías presentadas aquí hablan por sí solas. El trabajo excelente realizado por F. Pauwels, Van Gorder, James Dickson, Bosworth, Cleveland, Neer, McLaughlin y muchos otros, ha revelado el prognóstico peligroso en ciertos tipos de las fracturas arriba mencionadas. Los pacientes cuyas radiografías se muestran en esta comunicación representan una

serie consecutiva y todavía no he encontrado un caso en que no hubiera habido unión. Se han removido los clavos a unos cuantos pacientes, sin observarse efectos secundarios hasta el momento de preparar esta comunicación. A otros pacientes, estoy seguro, se les removerá el clavo más tarde. Mientras tanto, son pacientes ambulatorios, con muletas o un andador, pero no hacen peso, ni mueven la cadera afectada cuando experimentan dolor, espasmo muscular, limitación del movimiento o irritación.

CHIODI A TESTATA PER FRATTURE TRANSCERVICALI E SOTTOCAPITALI DELL'ANCA: *Nota Preliminare*

Qualsiasi metodo capace di migliorare i risultati delle fratture sottocapitali e transcervicali dell'anca e' degno di pubblicazione. Ecco perche' l'A. descrive in un articolo preliminare una nuova tecnica per le fratture nella regione trocanterica: tecnica che egli ha adottato da 1 anno ½ e che sembra promettere dei buoni risultati.

Le seguenti considerazioni giustificano l'adozione di un speciale chiodo a testata nelle fratture del collo femorale:

1. E' necessario mantenere una completa immobilizzazione del chiodo al livello del punto d'entrata nella sottile corteccia subtrocanterica. Una testata rigida attaccata mediante alcune viti all'asse femorale e' il mezzo piu' semplice per ottenere un' immobilizzazione. Qualsiasi spostamento a questo livello si trasforma in un movimento di "frusta" del chiodo nel tessuto spugnoso del collo e della testa femorale, con una conseguente mobilizzazione del frammento prossimale verso il frammento distale.

2. Un assorbimento osseo, con accorciamento del collo femorale, avviene sempre, indipendentemente da un' unione, o meno, dei capi ossei.

3. Durante la fase di accorciamento, un chiodo di Smith - Peterson oppure una vite a testa quadrata deve accompagnare i movimenti del frammento prossimale o distale (medialmente o lateralmente), a meno che i frammenti rimangano separati. Se lateralmente, la testa deve protrudere al di fuori delle corteccia, di modo che i movimenti che si compiono a questo livello si trasmettono alla sede della frattura qualora non si sia gia'verificata una solida unione.

4. Mentre il processo di guarigione conduce ad un accorciamento del collo femorale, il chiodo di Jewett deve attraversare il frammento capitale in una direzione mediale, entrando spesso nello cavita' articolare. Se la superficie di sostegno della testa femorale e l'acetabolo vengono rispettati, cio' non comporta alcun inconveniente.

La figura 1 dimostra la superficie di sostegno, facilmente visibile in ogni radiografia

Fig. 11.—Patient W. L. N. Films taken on day of injury (*extreme left*) and two months after operation. Union progressing.

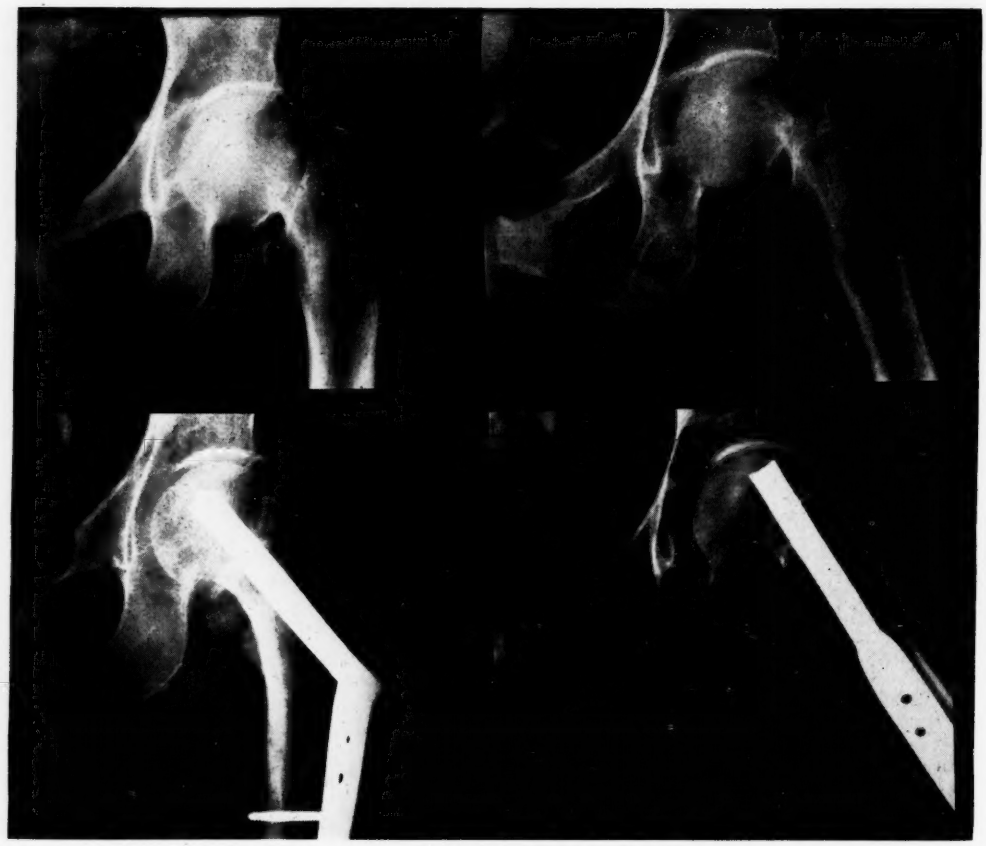

Fig. 12.—Patient H. C. Films taken on day of injury (*upper left*) and two months after operation. "Beak" broken off during reduction.

dell'articolazione coxo-femorale: nella figura si vedono pure le due zone di sicurezza subito al di sopra ed al di sotto della fovea capitis. La superficie di sostegno della testa femorale varia naturalmente nei movimenti di adduzione o di abduzione: ma quella dell 'acetabolo rimane costante. Queste zone di sicurezza dovrebbero essere esattamente annotate, avendo le gambe del paziente leggermente abdotte dal normale angolo di allineamento durante la deambulazione.

5. Se il chiodo rimane vicino alla superficie anteriore del collo femorale, il legamento rotondo non viene offeso anche se il chiodo perfora la testa sul margine della fovea. Se possibile, e' preferibile che il chiodo sia diretto subito al si sopra o al di sotto della fovea.

La figura 2 dimostra una posizione corretta del chiodo rispettivamente per una frattura transcervicale e sottocapitale: l'estremita' del chiodo e' infatti diretta appena al di sopra della fovea.

Nella figura 3 il chiodo e' invece nel centro del collo, diretto appena al di sotto della fovea.

Una posizione piu' o meno posteriore della fovea e' costante in tutti i casi esaminati radiologicamente.

6. Un chiodo di 130° puo' esser diretto, di solito, subito al di sopro della fovea: un chiodo di 120° al di sotto. Nel fissare mediante viti la testa del chiodo all'asse femorale e' preferibile ottenere un leggero grado di valgismo: il va-

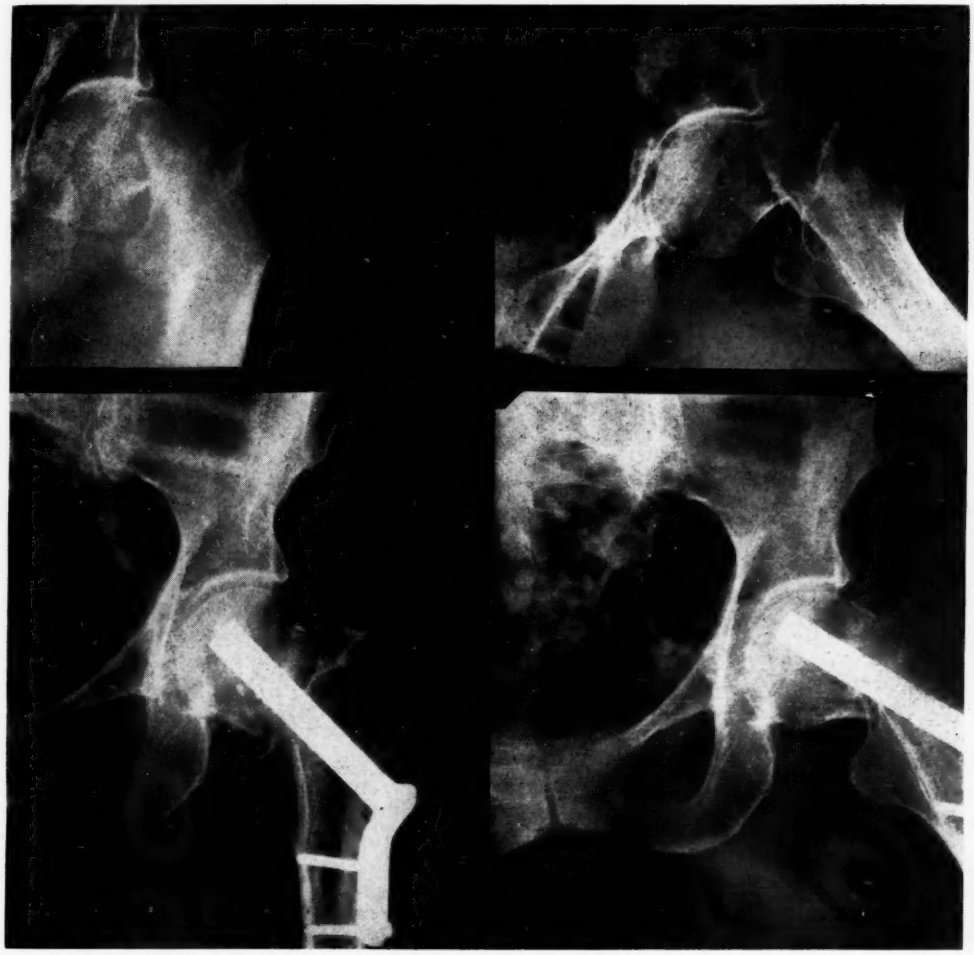

Fig. 13.—Patient I. D. Films taken on day of injury (*upper left*) and one month after operation. "Beak" partially detached at time of fracture.

rismo va evitato. Le migliori probabilita' di una perfetta unione si creano quando il chiodo forma un angolo retto con la sede della frattura.

7. Nessun danno deriva dall'eventuale penetrazione del chiodo nella testa femorale e nell'acetabolo, qualora questo avvenga in una zona non di sostegno: ma durante la convalescenza i movimenti dell'anca vanno ridotti ad un minimo. Il chiodo viene rimosso quando una solida unione ossea si e' stabilita: i pazienti possono allora aumentare gradatamente i movimenti dell'arto.

E' bene ricordare i seguenti punti fondamentali riguardo le manovre operative e postoperative:

(a) Le fratture vanno ridotte con accuratezza secondo la tecnica di Ledbetter, facendo appello a delle buone radiografie antero-posteriori e laterali.

(b) Durante le manovre di riduzione avviene spesso una rottura del cosidetto becco

della porzione piu' bassa del collo. La necessita' di una correzione operatoria e di un'osteotomia e' oggetto di discussione.

(c) Se il frammento prossimale e' mantenuto fisso da 3 aghi o da 3 fili di guida mentre il chiodo viene spinto al di sopra di uno di questi, la rotazione ed il scivolamento del frammento verrano evitati.

(d) L'inserzione del chiodo consente una sufficente immobilizzazione dei frammenti.

(e) La deambulazione con grucce puo' essere consentita abbastanza precocemente, ma il pieno sostegno del corpo va dilazionato fino a che una perfetta saldatura della frattura sia dimostrabile radiologicamente (da 4 a 6 mesi).

La figura 4 e le figure successive dimostrano una soddisfacente guarigione delle fratture. L'A. ha operato con questa tecnica una serie consecutiva di 12 casi.

Altre 2 fratture del tipo transcervicale e verticale sono state successivamente operate, ma l'operazione data solamente da una settimans. I chiodi sono stati rimossi senza inconvenienti in alcuni dei pazienti operati dall'A.: negli altri cio' verra' fatto in seguito.

L'A. ammette che un giudizio definitivo non puo' essere formulato per questo metodo di cura delle fratture del collo femorale. Le ra-

Fig. 14.—Patient S. H. S. Films taken on day of injury (*upper left*) and five weeks after operation. "Beak" broken off during reduction.

Fig. 15.—Patient M. S. Films taken on day of injury (*upper left*) and two weeks after operation. "Beak" intact in relation to hip. Slight valgus.

diografie riportate nell'articolo sono pero' abbastanza eloquenti: esse dimostrano che la incertezze prognostiche che esistevano per talune forme di queste fratture sono state eliminate grazie ai contributi di F. Pauwels, Vano Gorder, James Dickson, Bosworth, Cleveland, Neer, McLaughlin.

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Anomalous Opening of the Common Bile Duct into the Stomach

Report of a Case

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FAILURE to recognize variations and anomalies of the bile ducts has undoubtedly caused an appreciable number of surgical accidents, many of them avoidable. The following case of anomalous termination of the common duct is reported for three reasons: (*1*) because the condition is exceedingly rare; (*2*) because the symptoms and diagnosis leading to its recognition were suggestive of duodenal ulcer, and (*3*) because it reemphasizes the importance of careful surgical exploration.

We begin with a brief review of the literature on anomalies of the common bile duct.

Solnitzky[1] listed 5 anomalies of the common bile duct: 1. Common bile duct arising directly from the gallbladder, with the hepatic duct opening directly into the gallbladder and the cystic duct absent. 2. Common bile duct emptying directly into the pylorus. 3. Common duct bifid, one limb opening into the pylorus and the other into the duodenum. 4. Bifid common bile duct, both limbs opening into the stomach. 5. Two common bile ducts, the left opening into pylorus and the right into the duodenum.

Mentzer[2] stated that anomalous biliary ducts occur in about 10 per cent of persons and that in most cases the anomalous structures in man represent normal arrangements in the lower animals.

Owen[3] stated that the normal site of bile drainage of the bream, a fresh water fish, is the stomach.

Swartley and Weeder,[4] in their excellent review of the literature, listed the following cases of double ducts and aberrant ducts: 1. Laennec's case, in which a single common duct emptied into the stomach near the pylorus. 2. Vesale's case, in which the common duct was bifurcated, the upper duct emptying into the stomach and the lower into the duodenum. 3. A case described by Filippini, in which the duct emptied into the stomach through the pyloric ring. 4. Dimerbroek's case, in which there was a double common bile duct, both ducts emptying into the duodenum about a fingerbreadth apart. 5. Blasius' case, reported in 1674, in which there were separate entrances of the pancreatic duct and the common bile duct into the duodenum, and another case in 1667 similar to Dimerbroek's. 6. Boyden's case, in which the common bile duct was bifurcated and both parts emptied into the duodenum, the pancreatic duct joining the lower limb. 7. Gentile's case, in which two common ducts were present with outer and inner anastomosing ducts. The two common bile ducts had separate openings into the duodenum. 8. Kehr's case, reported in 1906, in which two common ducts were present but entirely separated, emptying into the duodenum close to each other. In 1912 Kehr reported a case in which the common duct had a septum and two separate openings into the duodenum. The lateral duct in this case contained a stone. 9. A case reported by Rodriques and Adriao, in which there were two common bile ducts throughout. Each duct was formed by two ducts, one from the quadrate lobe going to each.

REPORT OF CASE

H. K., a 34-year-old man, was admitted to the hospital Sept. 9, 1947, complaining that he was unable to retain solid food. He had had stomach trouble since the age of 19. A tentative diagnosis of peptic ulcer had been made on several occasions. He had been treated with diet, antispasmodics and antacid therapy, which gave him only partial relief. He consulted Dr. M. in August 1947. Roentgenograms were taken. The report was as follows: "He has been vomiting off and on for the past five weeks. The vomitus contains food which he has

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eaten as long as two or three hours previously. The vomitus is sour. At times there will be a little blood in the vomitus, and at other times there will be a brown substance something like coffee grounds. He has had a little, but not too much, heartburn. Heavy foods seem to upset his stomach. He has recently been on a very soft diet, mostly milk and rice. Last time he vomited was last night. He took barium this morning at seven o'clock and has not vomited since. He has had pain in his stomach all day now for the past six hours. He has not been constipated. He has lost about 13 pounds (5.9 Kg.) of weight in the last four weeks.

"Fluoroscopic study of the chest shows no abnormality in the heart or the lungs. The esophagus is normal. Barium taken six hours previously has all left the stomach and is present in the cecum and the distal portion of the ileum. The stomach is fish-hooked in form and not lying in normal position in the abdomen. Fluoroscopic study of the stomach proper shows no evidence of ulceration or malignant change in the stomach. The pyloric sphincter opens, but there is irregularity of the whole bulb, although barium does pass through this portion of the bowel. The descending portion of the duodenum is fairly large, and there is reverse peristalsis.

"From a roentgenologic standpoint this patient does have an ulcer of the duodenal bulb which is quite extensive in its involvement, but which at the present time is not causing obstructive symptoms. I am of the opinion that the vomiting prob-

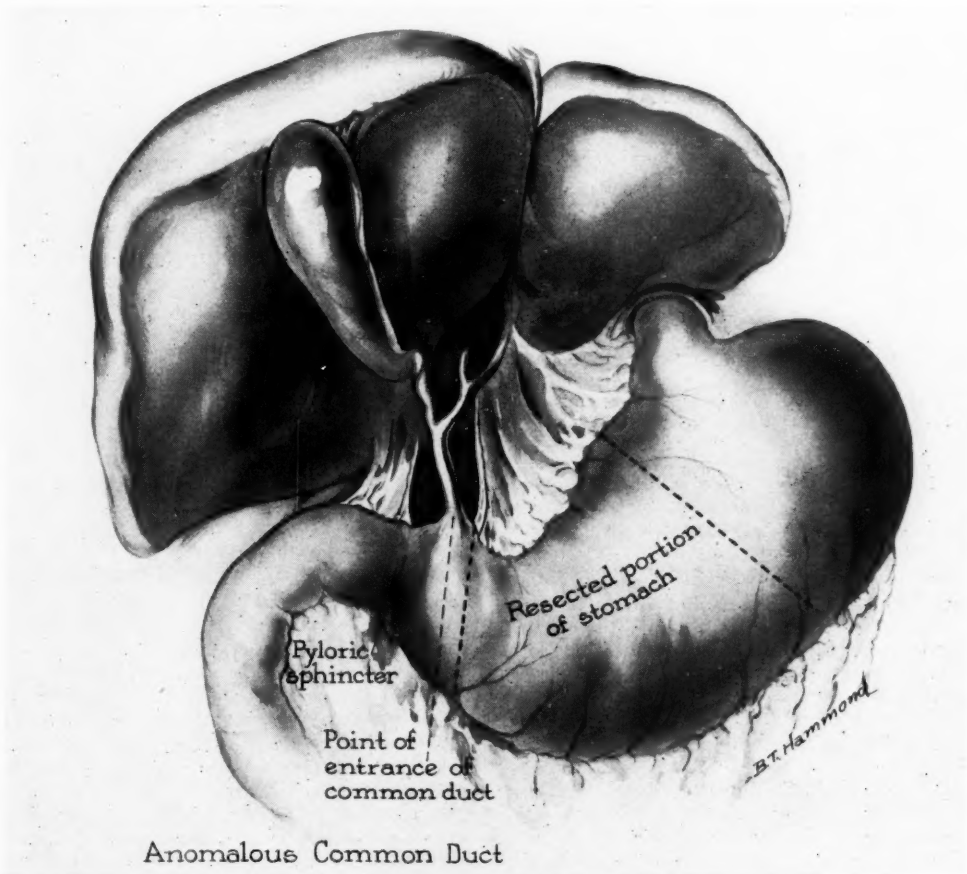

Fig. 1.—Artist's drawing of operative region, showing anatomic points of resection.

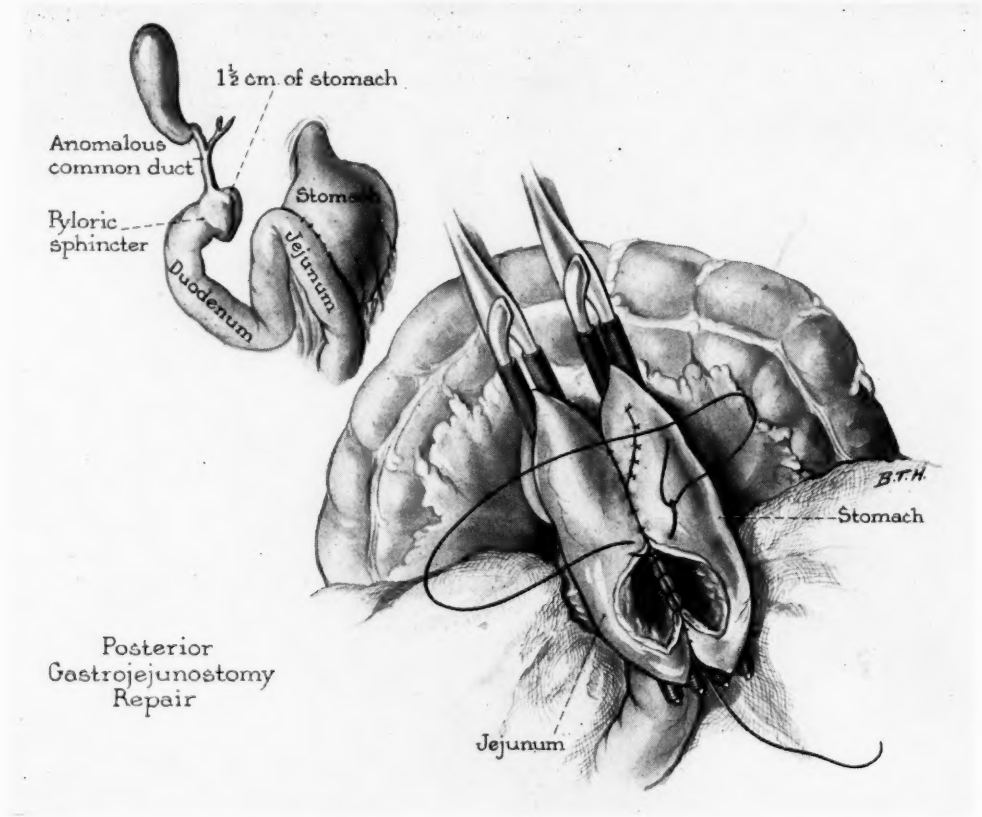

Fig. 2.—Operative technic (see text).

ably is due to irritation from the ulcer and not due to true obstruction. However, some heavy foods might conceivably obstruct the bowel where the liquids taken with the barium might pass through without any difficulty, as is the case today."

Antacid therapy was instituted, with lusyn before meals and gelucil after meals, but the treatment this time seemed to give the patient no relief. He was forced to cut down his intake to fluids only, and began to lose considerable weight. For this reason it was recommended that he come into the hospital for further study and probable surgical treatment.

Physical examination on admission to the hospital revealed the patient to be pale and underweight. He was about five feet five inches (165 cm.) tall and weighed 118 pounds (53.5 Kg.). He appeared nervous and anxious. The eyes, ears, nose and throat were essentially normal. The blood pressure in millimeters of mercury was 100 systolic and 70 diastolic. The heart rate was 80. The chest was within normal limits. Physical examination revealed a thin abdomen with prominent flaring of the costal margins. There was deep tenderness in the midepigastrium, about 2 fingerbreadths below the xiphoid. There was no spasm of the muscle, no splinting and no tenderness over the gallbladder area. The lower part of the abdomen was essentially normal. The impression was that of duodenal ulcer with partial obstruction of the pylorus due to inflammatory change and edema.

While in the hospital (September 9 to 14) the patient was treated by continuous suction and given intravenous injections containing large doses of vitamin B complex and vitamin C. He was also given vitamin K every other day. It was expected that with continuous suction most of the obstructive elema of the pylorus would subside enough in

a few days to facilitate accurate handling of the duodenal structures. The patient's symptoms were practically relieved when the continuous suction was active. He was given two preoperative blood transfusions.

Operation was performed on September 15, with the patient under gas-oxygen-ether anesthesia. A high right paramedian incision was made, and the peritoneum was entered for a distance of approximately 5½ inches (14 cm.). The stomach was palpated, as was also the duodenum, in an effort to find an area of induration to correspond with the suspected ulcer. This we were unable to do, and in view of the symptoms and the positive roentgen diagnosis, it seemed that further investigation was indicated. Accordingly a longitudinal incision was made ½ inch (1.2 cm.) proximal to the pyloric ring and carried upward for about 1½ inches (3.7 cm.). It was then noted that there was an opening just proximal to the pyloric ring, which was first interpreted to be a posterior perforating ulcer. When probed, however, it proved to be the opening of the common bile duct into the stomach, all completely proximal to the pyloric ring. Bile and a thinner, whitish fluid were exuded. The problem arose as to the significance of this observation in relation to the patient's symptoms. It seemed possible that, in the absence of any palpable ulceration, the symptoms certainly might be related to the fact that the biliary flow and probably the pancreatic flow emptied into the stomach instead of the duodenum. The lining of the pyloric end of the stomach was thin and appeared somewhat atrophic. The stomach was divided about 1.5 cm. proximal to the point at which the common duct entered the stomach, and the aperture was closed with two layers of continuous No. 000 chromic sutures, with several interrupted linen sutures to reinforce the second layer. About three-fifths of the stomach was removed, and a Polya type of repair with posterior gastroenterostomy was done. The peritoneum was closed with No. 00 continuous chromic sutures, No. 000 interrupted sutures to approximate the rectus muscle and No. 00 chromic sutures for the anterior fascia. Reinforcement was supplied by No. 0 chromic interrupted sutures. The skin was closed with fine cotton mattress "on edge" continuous sutures, and the wound was supported with four heavy silk sutures, Davey buttons being used for retention.

The course of the patient in the hospital after operation was entirely satisfactory. His blood pressure was maintained throughout the operation by infusions of 1,500 cc. of plasma, and his immediate postoperative condition was excellent. On the second night after the operation he was given 500 cc. of fresh blood. Continuous suction through a Levine tube was maintained for three days, and during this time he was given intravenous fluids, including ascorbic acid and B-complex vitamins. On the morning of the fourth day the tube was withdrawn and the patient was allowed to begin taking sips of water, tea and gelucil. He progressed well and was taking light soft food on the fifth postoperative day; by the seventh day he was taking a soft, bland diet without difficulty. He was discharged home on September 24, apparently in excellent condition, and was instructed to continue his bland diet until otherwise instructed.

Pathologic Observations.—Grossly the specimen was a large segment of stomach exhibiting two broad and rather poorly defined areas approximately 4 by 4.5 cm., which showed a loss of rugae but no remarkable thickening of the walls. No papillary process or other typical ulcer was identified grossly. The pyloric ring was not positively identified.

Histologic examination revealed a considerable increase of the number of parietal cells in the midportion of the stomach, almost to the exclusion of the chief cells. This would suggest a considerable increase in hydrochloric acid secretion. Other portions, taken toward the pylorus, showed considerable thinning of the mucosa and were associated with narrow-edged defects, but there was no evidence of positive inflammatory activity, particularly of the diffuse type sometimes associated with these and at other times occurring as isolated islands, small foci of low grade chronic inflammatory reaction or even scar tissue reaction. One such area extended to the muscularis of the submucosa. This indicates atrophy of the mucosa in this area, such as would develop subsequent to a prior broad ulceration associated with repeated pinpoint ulcerations, healing and in one case evidently penetrating to the muscularis. There was no evidence of present ulceration, polyposis, specific infection or malignant change. The pathologic diagnosis (Dr. W. E. B. Hall) was old healing ulcer of the stomach.

The patient was seen at frequent intervals after his discharge from the hospital. Except for slight drainage at the upper angle of the wound for a few days, he made a rather uneventful recovery. In one month after his discharge he had gained 15 pounds (6.8 Kg.), and eight weeks after the operation he went back to his work in a packing house. Since that time he has not cooperated in his follow-up visits, and our recent attempts to locate him have been unsuccessful.

SUMMARY

1. A case of anomalous opening of the common duct into the stomach is reported. Only 2

other cases apparently entirely similar to this case are mentioned in the literature, so far as we are able to determine. We could find no details of either of these.

2. The relation of the anomaly to the symptoms presented by this case is uncertain, but it seems possible that it may have been at least a factor.

SOMMAIRE

Un cas d'ouverture anormale du Cholédoque dans l'estomac est rapporté Deux cas seulement, tout-à fait semblables, furent trouvés par l'auteur dans la littérature; l'auteur ne trouva aucun détail de l'un ou de l'autre de ces deux cas.

Les rapports de cette anomalie aux symptômes presentés par la malade sont incertains mais il paraît passible que ce fût un facteur.

ZUSAMMENFASSUNG

1. Ein Fall von abnormaler Muendung des Ductus choledochus in den Magen wird berichtet. In der Literatur werden, soweit wir feststellen konnten, anscheinend nur zwei aehnliche Faelle erwaehnt. Ueber keinen dieser beiden Faelle konnten wir Einzelheiten ausfindig machen.

RIASSUNTO

1. Descrive un caso di sbocco anomalo del dotto comune nello stomaco. Nella letteratura esisterebbero solo due casi consimili, di cui l'A. non e' pero' riuscito a rintracciare i particolari.

2. L'A. ritiene possibile un rapporto causale fra l'anomalia e l'insorgenza dei sintomi clinici.

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Internal Hernia as a Cause of Intestinal Obstruction

Report of Three Cases

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THE incidence of internal hernia is not great. Its occurrence as a cause of intestinal obstruction is even less, as evidenced by the large number of recorded cases in which the condition was discovered incidentally during laparotomy or at postmortem examination. However, acute intestinal obstruction secondary to an internal hernia is a formidable problem when it arises. Every surgeon who treats acute disease of the abdomen should be cognizant of the possibility in any given case that an internal hernia may be present, causing intestinal obstruction.

The purpose of this paper is to review the subject of internal hernia as a cause of obstruction and to present 3 illustrative cases.

Wangensteen[1] cited a report of 21 cases of internal hernia during an eighteen-year period in Freidrichshain Hospital in Berlin, during which 1,795 cases of external hernia were operated. He cited Guillame's observation of 400 cases of acute intestinal obstruction, of which only 4, or 1 per cent, were cases of internal hernia. McIver[2] observed only 3 cases of internal hernia in 335 cases of acute intestinal obstruction, an incidence of 0.9 per cent. Mayo, Stalker and Miller[3] reported 39 cases of intra-abdominal hernia treated surgically at the Mayo Clinic from 1910 to 1939. In 21 of these cases the condition originated postoperatively and in the other 18 it was due to congenital defects. In 1941 Hansman and Morton[4] made a thoroughgoing review of the literature and reported 467 cases of internal hernia, excluding those in which the hernia was secondary to a previous surgical procedure.

In striving toward a concise classification it is difficult to go beyond dividing the hernias into those occurring into or through a congenital fusion or rotation defect in the peritoneum and those occurring into or through a defect produced by an earlier surgical procedure.

Hansman and Morton[4] have made a revealing classification of hernias occurring through congenital defects, including the incidence of each type of hernia observed in their review of 467 cases:

Paraduodenal	Left-paraduodenal Right paraduodenal Infraduodenal	53%
Pericecal and terminal ileum	Pericecal Ileocolic Ileoappendicular	13%
Perimesenteric	Mesenteric Ascending mesocolon	8%
Foramen of Winslow		
Pelvic	Broad ligament (excluding those secondary to uterine suspension) Prevesicle	7%
Intersigmoid		6%
Miscellaneous	Through great omentum defect Behind aberrant middle colic artery Into rectum Back of pelvic peritoneum Into properitoneal fat low on anterior abdominal wall Back of vitelline duct Through falciform ligament of liver	5%

Obviously, if hernias secondary to surgical procedures were included in this large series the percentages would vary considerably. An explanation of some of these types is to be found in Hansman and Morton's[4] article.

The usual types of internal hernias that follow surgical procedures are not nearly so numerous. After posterior gastroenterostomy, failure of the transverse mesocolon to remain attached to the stomach may result in an aperture through which a loop of small intestine may herniate and become obstructed. Mayo, Stalker and Miller[3] reported 6 such hernias. The foramen formed by the loop of jejunum stretched from the duodenojejunal junction to the site of a gastrojejunostomy, either anterior or retrocolic, may serve as a site of herniation. The last-mentioned authors

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reported 4 such hernias, 2 of the anticolic and 2 of the retrocolic type. The same authors referred to 2 hernias occurring through the aperture lateral to a loop of colon brought out for colostomy. Goode and Newbern[5] reported 9 and Prulang[6] reported 14 cases of intestinal obstruction resulting from herniation of bowel through defects in the broad ligaments of the uterus after Baldy-Webster suspension of that organ. Any site at which an abnormal opening is produced by an intra-abdominal operation or by an inflammatory residue may conceivably serve as a site of herniation and obstruction of the bowel.

The cause of the condition is obviously composed of two factors: (*1*) the presence of an aperture and (*2*) the occurrence of a situation causing a loop of bowel to enter the aperture and become strangulated. The formation of an aperture by surgical measures requires no explanation. The presence of an aperture serving as a hernial site in persons who have never undergone previous surgical treatment has been discussed in virtually all articles on internal hernia. The consensus is that such mesenteric defects are congenital. This is suggested by the occurrence of internal hernias in infants, the frequent discovery of such defects incidentally at autopsy and laparotomy, and the complex embryologic processes involved in formation of the mesentery, which allow frequent opportunities for variation. Cutler and Scott[7] point to the occurrence of multiple fenestrations in the mesentery of the goose as additional evidence that such defects are congenital.

The precipitating cause of internal hernia cannot be determined by pressure variations in the abdominal cavity, although various authors have pointed to internal hernias occurring after a difficult bowel movement, after straining to open a window, or after an abnormally large meal. Obviously, the pressure at any one point in the abdomen is the same as that at any other point in the cavity at the same time. Because of the relatively resistant walls formed by the abdominal parietes and the absence of air-tight compartments in the abdominal cavity, any increase of pressure in one part of the abdomen is coincidentally transmitted to all other parts of the cavity. It seems most probable that a knuckle of bowel enters the aperture by chance during periods of abnormal intestinal motility and that peristaltic action and accumulation of gas in the involved loop carries the loop through to the point of intestinal obstruction.

Individual consideration of three particular types of internal hernia producing intestinal obstruction, together with an illustrative case of each type, is presented here.

Hernia Through a Defect in the Great Omentum.—The rarity of herniation of the bowel through an aperture in the great omentum is attested by the fact that Hansman and Morton[4] noted but 5 such cases in their review of 467 cases of internal hernia. Martzloff[8] in 1930 reviewed 15 cases found in the literature from 1840 to 1929. He added what he believed to be the sixteenth recorded case. In his review the following data were disclosed: The age of the patients varied from 12 to 82 years. There were 3 female and 9 male patients; of 3 the sex was not known. A portion of the small bowel was involved in the hernia and strangulated in 14 cases; the colon (transverse and descending portions) was involved in 1 case. In all cases except 1 there were symptoms and signs of acute intestinal obstruction. In the single exception a diagnosis of perforated gastric ulcer was made. In 3 cases the outcome was not known. In another 3 cases the patients were not operated on and the diagnosis was made at autopsy. Eight patients were operated on and recovered. In 1 operative case the cause of obstruction was not found at laparotomy and the diagnosis was made only at autopsy. In Martzloff's case[8] the patient was a 24-year-old white man who was operated on because of a clinical diagnosis of possible appendicitis. At operation no cause of abdominal distress could be detected until the greater omentum was drawn down over the intestine preparatory to closing the peritoneal cavity. It was then noticed that two holes were present in the omentum and that through one a purplish-pink loop of ileum, about 15 cm. in length, was protruding. The ileum was easily reduced, the apertures in the omentum were closed and the patient recovered uneventfully.

Sanes and Postoloff[9] in 1944 reported 1 case of strangulation of the small intestine due to

prolapse through an aperture in the great omentum. These authors noted Martzloff's 15 cases,[8] found records of 4 patients operated on for this entity from 1932 to 1942, and added their own case to the small series.

Our own experience is indicated by the following case.

CASE 1.—A 29-year-old white man, an iron worker, entered the Veterans Hospital in Salt Lake City at 5 a.m. on Aug. 26, 1949, complaining of abdominal pain. He had felt perfectly well until he awoke from a sound sleep at 2:30 on the morning of admission, with a bloated feeling in the abdomen. He took two teaspoonfuls of "sal hepatica" and approximately thirty minutes later had a severe and gradually increasing periumbilical pain. This pain, according to the patient's account, increased to great severity, and he rolled and turned in bed without relief. The pain was constant, accompanied by persistent nausea and two episodes of vomiting. A normal bowel movement had occurred the day before admission, but no bowel movement or passage of flatus had occurred since. A carefully taken history failed to reveal anything of further significance except that the patient had been discharged from the army as psychoneurotic.

Physical examination revealed him to be well developed and strongly muscular. He was writhing and turning in obvious acute distress and complaining bitterly of abdominal pain. The rectal temperature was 99 F., the pulse rate 112, and the blood pressure 130 systolic and 100 diastolic. Slight generalized abdominal distention was observed. The abdomen was voluntarily held rigid. On relaxation there was a questionable amount of generalized muscle resistance. Marked tenderness was present in the epigastrium and in the right lower quadrant. Pressure over the epigastrium produced pain at McBurney's point. No masses or organs were palpable. The bowel sounds were of normal intensity and pitch but of somewhat decreased frequency.

The initial impression of the admitting physician was (*1*) acute pancreatitis; (*2*) possible acute appendicitis, and (*3*) possible acute intestinal obstruction.

Eleven mg. of morphine, followed in forty-five minutes by a second dose of 16 mg., appeared to give little relief. The patient vomited a large number of whole beans.

The white blood cell count was 39,000 per cubic millimeter, with a marked shift to the left. The urine showed a 3 plus sugar content and no acetone. The value for blood amylase was 35 mg., and that for blood sugar 310 mg., per hundred cubic centimeters. The carbon dioxide combining power

Fig. 1 (Case 1).—Strangulation obstruction. Hernia through defect in great omentum.

was 35 per cent. The hematocrit reading was 56 per cent and the value for hemoglobin 19.4 Gm. A flat plate of the abdomen revealed a lattice of accumulated gas in several loops of small bowel. This was located in the left upper quadrant. A film taken five hours later showed a further accumulation of gas in the same region, without progression into the colon.

The patient was watched carefully in the ward, with considerable concern for the hyperglycemia and glycosuria. Laboratory determinations of the pertinent values were repeated and verified. The medical consultant did not believe the patient to be in a state of diabetic acidosis. Repeated examinations of the abdomen revealed gradually developing distention, together with diminution in frequency and increase in pitch of the bowel sounds. The patient was taken to the operating room at 1 p.m., eight hours after admission, with the diagnosis of acute obstruction of the small intestine, possibly due to an internal hernia. At this time the abdomen was tightly distended and tender, and peristaltic action of the bowel had ceased. Two thousand cc. of physiologic solution of sodium

chloride had been given intravenously prior to operation.

Twelve mg. of pontocaine, preceded by 50 mg. of ephedrine, was administered as a spinal anesthetic. The patient became severely depressed, and the blood pressure, which had been 100 systolic and 80 diastolic before administration of the anesthetic, became unobtainable. Both lower extremities were wrapped with compression bandages, and during the next two hours 500 cc. of irradiated plasma and 1,000 cc. of physiologic solution of sodium chloride were administered intravenously. The blood pressure returned at 80 systolic and 60 diastolic and gradually rose to levels of 110 and 70 respectively. The patient was returned to the ward. One thousand cc. of whole blood was administered to allow further stabilization.

At 10 p.m., seventeen hours after admission and nineteen and one-half hours after onset of symptoms, the patient was returned to the operating room. With the continuous catheter spinal technic an anesthetic was given without untoward results. Blood and saline solution were administered by two routes. Laparotomy was performed through a right paramedian incision extending above and below the umbilicus. Upon opening the abdomen a large amount of bloody serous fluid (estimated at 2,000 cc.) spilled from the abdomen. Another measured amount of 2,500 cc. of similar fluid was aspirated. Distended loops of small bowel contained dark hemorrhagic fluid. It was estimated that this represented another approximate 1,000 cc. of plasma loss. Moderately distended loops of jejunum were present in the upper part of the abdomen, and a dark, hemorrhagic loop of small bowel was present in the lower part. Examination revealed that approximately the distal 6 feet (182.88 cm.) of ileum had herniated through a small ringlike aperture near the edge of the great omentum. In addition, this loop of small bowel had undergone 180-degree volvulus, resulting in obstruction and strangulation of the small bowel. The constricting ring was severed and the bowel packed with warm saline lap pads while the anesthetist administered 100 per cent oxygen. This was continued for approximately forty minutes. All except the proximal 18 inches (45.72 cm.) of strangulated bowel regained its contractility and apparent viability. This segment remained dark, lusterless and flaccid. Accordingly, it was resected, finger pressure being used to control the intestinal contents. A two-layer interrupted silk open anastomosis of the end-to-end type was done. The contractility, vascularity and lumen patency of the remaining bowel appeared good. A gastric tube was manipulated from the stomach into the duodenum. The abdomen was closed and the patient returned to be with a blood pressure of 120 systolic and 90 diastolic. He was in fair general condition. Five hundred cc. of whole blood, 500 cc. of plasma, and 1,000 cc. of 5 per cent dextrose in saline solution had been administered during the operation.

The postoperative course was uneventful. Continuous gastric and intestinal aspiration, penicillin and streptomycin therapy and intravenous fluids and blood were employed. Peristaltic sounds were present thirty-six hours after the operation, and black, liquid stools were passed on the third postoperative day. The sutures were removed on the thirteenth day and the patient discharged a day later. Repeated blood sugar determinations, dextrose tolerance tests and urinalyses done before discharge gave normal results. The patient was seen one month later and stated that he had been well since leaving the hospital.

This case was of great interest because of the rapidly fulminating course of the lesion and the occurrence of hyperglycemia (blood sugar, 310 mg. per hundred cubic centimeters), which caused considerable confusion in establishing a diagnosis and planning a course of treatment. The hyperglycemia was discovered by a watchful laboratory technician in the process of doing a serum amylase determination. The urine showed a 3 plus reaction for sugar but no acetone. The carbon dioxide combining power (35 per cent) indicated that acidosis was not present in sufficient degree to produce the extreme peritoneal irritation observed. The subsequent development of events seem to indicate that the hyperglycemia was an indication of severe trauma and impending shock.

It seemed obvious to us, after making an estimation at operation of a 5,000 cc. plasma loss, that the patient had compensated to an absolute maximum. Replacement of tissue fluids prior to the first attempt at surgical intervention had been grossly inadequate. Had we not fallen into this error and underestimated the gravity of the situation, the patient might have tolerated the first spinal anesthetic. Operation at this time might have spared him a resection of the small bowel.

Davidson and his associates[10] in 1946 published a report on abnormal biochemical changes in patients with severe, acute medical illnesses, with and without peripheral vascular failure. These authors reported disturbances

of carbohydrate metabolism, including hyperglycemia, occurring in the shock syndrome. Four of the patients died in peripheral vascular collapse from the following diseases respectively: meningitis, dissecting aneurysm, gastrointestinal hemorrhage and barbiturate poisoning. Shortly prior to death each of these patients showed the following levels of blood sugar, all hyperglycemic: 234, 332, 552 and 370 mg. per hundred cubic centimeters respectively. None of these patients had evidence of diabetes or of any other disease known to disturb carbohydrate metabolism. Four other patients, who showed less severe degrees of hyperglycemia, subsequently recovered from their illnesses and showed no abnormalities of carbohydrate metabolism after recovery.

In a recent publication Beecher[11] has published data indicating that the blood sugar level appears to rise significantly both with increase in blood loss and with increase in severity of shock. His data were obtained from wounded men arriving at a forward hospital during the last war. With 80 to 90 mg. per hundred cubic centimeters serving as a norm, Beecher noted that the value for blood sugar averaged 134 mg. per hundred cubic centimeters in wounded men who showed no shock to 202 mg. in men who showed severe degrees of shock. From zero to six hours after injury the blood sugar value averaged 182 mg.; seven to twelve hours after, 161 mg., and thirteen to twenty-four hours after, 144 mg. Soldiers who showed blood loss from 0 to minus 5 per cent had an average blood sugar level of 143 mg., and the elevation varied proportionately with increase in the amount of blood loss until men who had lost 40 per cent or more of blood volume showed an average blood sugar value of 194 mg. This author stated, "Presumably the elevation in blood sugar level is due to mobilization of liver glycogen following adrenal activity, and probably it reflects the emotional and physical stress the individual has experienced."

In 1944 Svante Annersten,[2] of Uppsala Medical School (Sweden), published an interesting and pertinent article entitled *Preparedness for Postoperative Shock*. This author deplored the fact that all the signs indicating a diagnosis of shock occur after shock is well established. In a search for a criterion upon which to diagnose impending shock, blood sugar values were determined for 40 patients after major surgical procedures. The blood sugar level in all cases was elevated an hour after the operation. The average preoperative level of blood sugar was 100 mg. per hundred cubic centimeters; the average postoperative level, 180 mg. Annersten stated that in patients who later showed signs of shock the blood sugar level rose more rapidly, rose to higher levels, and persisted at high levels as long as one or two days. Patients who showed such variations in the postoperative blood sugar level were treated for shock. Data on the individual cases are not given. It is suggested that blood sugar determinations be utilized to diagnose impending shock.

Our purpose is not to establish a positive relation between shock and hyperglycemia. However, by deduction from the references just cited and correlation of laboratory and clinical data in our single case, we believe it can be presumptively stated that the occurrence of hyperglycemia in association with an acute fulminating disease indicates a severe degree of physiologic upset and impending shock. The physiologic trauma of an established safe spinal anesthetic was sufficient to throw our patient into extreme peripheral vascular collapse. Laparotomy some hours later revealed that approximately 5,000 cc. had been lost from the patient's effective circulation into the peritoneal cavity. It is our impression that the hyperglycemia was an indication of the catastrophic nature of the disease. Had we been aware of the significance of this abnormal observation, the difficulties encountered might have been anticipated and handled more expeditiously.

Hernia Through a Defect in the Mesentery.—In Hansman and Morton's review of 467 cases[4] there were 52 cases of transmesenteric hernia. Fourteen patients had defects in the ileocecal mesentery, and 38 had defects at higher levels in the mesentery of the small bowel. Cutler and Scott[7] reported 2 new cases and reviewed 50 cases from the literature on transmesenteric hernias. In 35 of the 50 cases reviewed the defect was in the ileocecal mesentery and was usually round or oval, with smooth, round peritonealized edges. There was

no significant difference in sex incidence. The age of the patients varied from 4 days to 73 years.

In both cases reported by Cutler and Scott[7] the patients were children, aged 6 years and 21 months respectively. In both the disease ran a fulminating course, with symptoms of abdominal colic, vomiting and obstipation. Both were operated upon and relieved of small bowel hernia through the ileocecal mesentery. The lapse of time from onset of symptoms to operation in each case was under sixteen hours, and both patients recovered.

The clinical picture in the 52 cases considered by these authors was that of acute intestinal obstruction. Occasionally a palpable mass was present in the abdomen. In 62 per cent of the 50 patients gangrenous bowel was present, with symptoms of 6 hours' to 11 days' duration.

Fig. 2 (Case 2).—Hernia into mesenteric defect. Radiopaque substance visible in obstructed bowel, taken prior to patient's admission to hospital.

CASE 2.—A 42-year-old white man was admitted to the Veterans Administration Hospital on May 1, 1948, with the presenting complaints of cramping midabdominal pain of four days' duration, repeated vomiting and obstipation.

The onset of pain occurred while the patient was at rest at home. He was seen soon after the onset of pain and given a "hypo." His attending physician had treated him in 1942 for perforated peptic ulcer and had told him that this pain was associated with the ulcer. Repeated hypodermic injections were given for control of the pain. The patient restricted himself to taking liquids by mouth, but vomited several times during the four-day period prior to admission. A normal bowel movement had occurred on the day of onset of the pain, but no stools or flatus had been passed since. The symptoms persisted for the four days prior to admission, with varying degrees of intensity. The pain was referred to the lower part of the abdomen and the periumbilical region but had no definite localization and did not radiate. The patient was referred to this hospital by his physician.

Physical examination revealed him to be well nourished and apparently in no acute distress. The temperature was normal, the pulse rate 90 and the blood pressure 118 systolic and 72 diastolic. The examination gave negative results except for the abdomen, which was slightly distended, rising 2 cm. above the xiphopubic line. It was generally soft and nontender. Peristalsis was markedly hyperactive, and the bowel sounds were slightly high pitched.

The laboratory revealed normal urine, a hematocrit reading of 40, and a leukocyte count of 9,000 per cubic millimeter of blood. A flat plate of the abdomen showed a few loops of jejunum filled with gas. A small amount of gas was present in the colon also.

An initial diagnosis of partial obstruction of the small bowel was made, and a regime of "nothing by mouth," intestinal decompression with a Cantor tube, intravenous administration of fluids and penicillin therapy was instituted. The patient's condition was carefully observed over the next sixty hours. On May 3 the temperature was 99.6 F., the pulse rate 100 and the respiratory rate 20. The abdomen was more distended than at the time of admission. The abdomen had remained soft but was generally tender. Peristaltic sounds occurred at a rate of 30 to 40 per minute; these were high pitched, and occasional metallic tinkles were heard. A roentgenogram of the abdomen revealed the Cantor tube to be in the jejunum. There was a moderate increase in the amount of gas in the small bowel. In addition to the loops of jejunum described, several gas-distended loops of ileum were visible.

On May 3 at 2 p.m., sixty-two hours after admission and seven days after the onset of symptoms, a laparotomy was performed with the patient under general anesthesia. Distended loops of small bowel bulged into the wound. The terminal part of the ileum was identified and followed proximally until the area of obstruction was found. About 2 feet (60.96 cm.) from the ileocecal valve the ileum dipped into the right lower quadrant and into an abnormal peritoneum-lined pouch which was limited posteriorly by the right iliac vessels, on the right side by the colon and the associated peritoneal reflection and anteriorly by the radix mesenterii. On closer inspection the abnormal pouch seemed to be the result of an embryologic fusion failure of the radix mesentery of the terminal part of the ileum. The loop of ileum incarcerated in this pouch was removed without difficulty and was definitely viable. The defect in the root of the mesentery was of such size that closure not only was not necessary but seemed unfeasible with great vessels forming the posterior wall.

The postoperative course was uneventful, and the patient was discharged on the eighteenth postoperative day. He has been seen recently and states that his general health has been good. There has been no recurrence of abdominal pain.

This patient had suffered the calamity of a ruptured peptic ulcer six years prior to his admission to this hospital. Considering this fact, it was thought that the small bowel obstruction might well be attributed to intra-abdominal adhesions or to a combination of adhesions and obturation. Partial small bowel obstruction from such a cause frequently responds to conservative therapy. It was on this basis that the conservative regime described was used. After sixty hours' trial, the disease had progressed despite treatment. The general physiologic condition had been improved, and decompression had kept the bowel in good condition. Laparotomy was essential at this time.

The hernia in this case is somewhat difficult to classify. It did not meet the requirements of the pericecal, ileocolic or ileoappendical hernias. There appeared to be a fusion defect in the mesentery of the terminal portion of the ileum. The defect involved only the inferior leaf of the mesentery, the superior leaf remaining intact and forming the sac that enveloped the herniated loop of ileum.

Hernia Through the Foramen of Winslow.—Hernia through the foramen of Winslow differs from the two types of hernia already discussed in that it occurs through a normal aperture rather than through a congenital defect. This semicircular orifice, located about 5 cm. to the right of the first lumbar vertebra, is bounded anteriorly by the lesser omentum containing the portal vein, hepatic artery and common bile duct; posteriorly by the inferior vena cava; above by the caudate process of the liver, and below by the first portion of the duodenum.

In 8 per cent of Hansman and Morton's series[4] the hernia occurred through the foramen of Winslow. Ullman,[13] in an excellent review in 1924, summarized 29 cases from the literature and added 1 of his own. In 1929 Douglas[14] reported a case before the New York Surgical Society in which the diagnosis was made preoperatively by roentgen study with the aid of a bismuth contrast meal. At operation on the following day no hernia was present, but a 10-cm. loop of ileum showed narrowed, compressed areas at each end. It was assumed that the hernia had been spontaneously reduced prior to operation. In 1945 Hollenberg[15] reported another case in which the diagnosis was made preoperatively with the aid of a barium meal and enema. This patient died on the fourteenth day after the hernia had been surgically reduced.

Ullman's review,[13] which covered a hundred-year period from 1824, revealed the following data: The age of patients involved varied from 5 to 66 years. There were 5 female and 20 male patients; of 5 the sex was not known. The small intestine herniated into the lesser sac in twice as many instances as did the large intestine. In 10 instances the diagnosis was made at autopsy. Twenty patients were operated on; of these, 11 died during the postoperative course. Ullman noted than in 11 of the 30 cases epigastric or periumbilical swelling developed soon after the onset of symptoms. At that date, Ullman stated, the preoperative diagnosis of hernia of the foramen of Winslow had never been made. It is our opinion that the establishment of a preoperative diagnosis by the two authors mentioned does not represent an advancement, since such methods necessarily demand delay in therapy and possible damage to a diseased bowel.

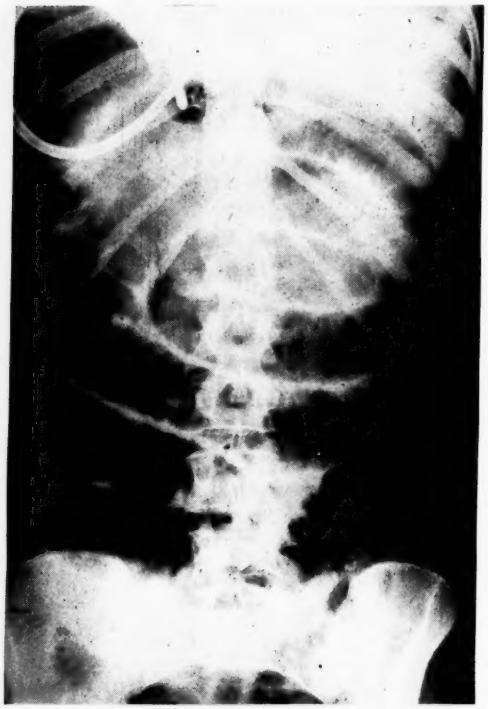

Fig. 3 (Case 3).—Obstruction due to hernia through foramen of Winslow. Closed bowel loop through foramen visible at tip of Levine tube.

Case 3.—At 1 a.m. on Aug. 24, 1947, a 25-year-old white woman was admitted to the emergency service of Wesley Memorial Hospital, Chicago. The patient complained of severe cramping abdominal pain of sudden onset and also of vomiting. At 10 p.m., three hours prior to admission, she had eaten a meal of chop suey. At midnight, one hour prior to admission, she had been seized with severe cramping pain across the epigastrium. This pain traveled through to the back, below the right scapula. In the hour immediately prior to admission there had been two episodes of vomiting. The vomiting consisted of food and "bile." The remainder of the history was noncontributory.

Physical examination revealed the patient to be well developed and well nourished but in acute distress. The temperature, the pulse rate, the respiratory rate and the blood pressure were within normal limits. Abnormal observations were limited to the abdomen, which was scaphoid; slight muscle resistance and tenderness were elicited in the right upper quadrant. The bowel sounds were normal in both frequency and pitch.

The leukocyte count was 10,200 per cubic millimeter of blood, and the urine was normal. A diagnosis of acute biliary colic was made, and conservative treatment was instituted. This consisted of continuous gastric suction, the withholding of anything taken by mouth, parenteral feeding and the administration of morphine and atropine.

The patient was next examined at 10 a.m., nine hours after admission. At this time she complained that the pain was more severe and had become continuous. Examination revealed the abdomen to be moderately distended (to about 1 cm. above the xiphopubic line). Tenderness and muscle resistance in the epigastrium and the right upper quadrant were increased over that elicited on the previous examination. Auscultation revealed the bowel sounds to have decreased in frequency and to have assumed a definitely higher pitch, with occasional metallic tinkles. Careful questioning indicated that the patient had passed no stools or flatus since the onset of the illness.

A flat plate of the abdomen at this time confirmed the impression of small bowel obstruction. A lattice of distended loops of small bowel was visible.

At noon, eleven hours after admission and thirteen hours after the onset of the illness, a spinal anesthetic was administered and the abdomen explored through a right paramedian incision. Collapsed loops of ileum were picked up and followed proximally. The collapsed bowel led to the upper part of the abdomen and was seen to pass anterior to the omentum and the transverse colon. It was then realized that the circumstances were unusual. By gentle traction a 6-inch (15 cm.) loop of small intestine was freed from the foramen of Winslow. The loop, estimated to be 8 feet (243.84 cm.) proximal to the ileocecal valve, showed the effects of constriction, and the serosa was covered with petechial hemorrhages. The serosal luster was normal, and the loop was definitely viable. The foramen of Winslow was larger than normal and readily admitted 2 fingers. The foramen was not closed.

Postoperatively, continuous gastric suction and intravenous feedings were carried out for two days. On the third postoperative day the patient tolerated a liquid diet. She was discharged from the hospital on September 5, the eleventh day after operation.

Diagnosis and Treatment.—The diagnosis and treatment of internal hernia is the diagnosis and treatment of intestinal obstruction with the potentiality of bowel strangulation. Discussion of the management of intestinal

obstruction is beyond the scope of this paper. However, in any given case of intestinal obstruction in which the causative factor is not discernible, internal hernia should be considered. A vague mass or a palpable swelling in the abdomen may occur, as several authors have mentioned. Laboratory data is of little help in making a specific diagnosis of internal hernia. Roentgenograms of the abdomen show that the usual lattices of distended loops of bowel may be closely held together as though in a sac (Alexander[16]). Regardless of all studies and deductive processes, the final diagnosis will usually be made at laparotomy. Knowledge of the condition and its possibilities will be appreciated by the surgeon at this time.

During the period of establishing a diagnosis, with the unavoidable delay of obtaining roentgenograms, awaiting laboratory reports and pursuing the necessary mental processes of diagnosis, the time need not be wasted. The condition of the bowel can be stabilized or improved by decompression with a Miller-Abbott tube or a Cantor tube. The general physical condition can be guided toward normal by the use of computed amounts of electrolytes, proteins and blood. By observation, a more accurate estimate of the condition of the patient and the status of his disease may be obtained. With such measures the lapse of time from admission to the hospital to entrance to the operating room, if not excessive, becomes an asset rather than a liability.

Operative treatment in a given case, with the numerous possible variations of internal hernia, can be determined only by the judgment and technical ability of the surgeon in charge.

SUMMARY AND CONCLUSIONS

Internal hernia as a cause of intestinal obstruction is rare. Nevertheless, the fulminating course of this condition and the disastrous results of delay in treatment demand that every surgeon who treats acute disease of the abdomen be aware of its possible presence.

A classification and brief description of types of internal hernia is given. Three illustrative cases of internal hernia are presented, including a case of hernia through a defect in the great omentum, associated with the unusual feature of hyperglycemia. This feature can be logically explained only by the assumption that large amounts of blood sugar were mobilized as a maximum physiologic attempt to combat sudden protein loss and impending shock. A case of herniation of the ileum through a defect in the ileocecal mesentery and another of hernia into the foramen of Winslow are also presented, with comments on these particular types of hernia.

The diagnosis of internal hernia should be considered in any case of intestinal obstruction in which the cause is not evident. The time required to establish a diagnosis should be utilized to improve the local condition of the distended bowel and the general condition of the patient.

SOMMAIRE ET CONCLUSION

Il est rare que la hernie interne détermine l'obstruction intestinale. Néanmoins, dans cette condition, le retard du traitement approprié est si désastreux que le chirurgien qui s'occupe des maladies aiguës de l'abdomen, doit songer à la présence possible de cette condition. L'auteur donne une classification et une description brèves des types de hernies internes. Trois cas sont présentés: un cas de hernie à travers un défaut de l'épiploon, associé avec hyperglycémie. Cette hyperglycémie peut être expliquée seulement par l'assumption de la mobilisation de grandes quantités de sucre sanguin pour combattre physiologiquement la perte soudaine de protéïne et par l'imminence du choc. Un cas de hernie de l'iléon à travers un défaut du mésentère iléocécale et une autre hernie à travers le trou de Winslow. L'auteur discute ces differents types d'hernies.

Le diagnostic de l'hernie interne doit être considéré dans tous les cas d'obstruction intestinale dont la cause n'est pas evidente. Le temps employé pour établir le diagnostic doit être utilisé pour améliorer les conditions locales de l'intestin distendu et l'état général du malade.

ZUSAMMENFASSUNG UND SCHLUSSFOLGERUNGEN

Ein innerer Bruch als Ursache eines Darmverschlusses ist ein seltenes Vorkommnis. Nichtsdestoweniger ist es wegen des heftigen Verlaufes der Erkrankung und angesichts der katastrophalen Folge einer Verzoegerung in

der Behandlung notwendig, dass jeder Chirurg, der akute Baucherkrankungen behandelt, sich einer solchen Moeglichkeit bewusst ist. Es wird eine Einteilung und eine kurze Beschreibung von Typen innerer Brueche gegeben. Drei erlaeuternde Faelle von innerer Hernie werden dargestellt, einschliesslich eines durch eine Oeffnung im grossen Omentum erfolgten Bruches, der mit dem ungewoehnlichen Bilde einer Blutzuckererhoehung einherging. Dieses Symptom kann logisch nur durch die Annahme erklaert werden, dass als aeusserster physiologischer Versuch, ploetzlichen Eiweissverlust und drohenden Shock zu bekaempfen, grosse Mengen von Blutzucker mobilisiert wurden. Ein Fall einer Ileumhernie durch eine Oeffnung im illeocecalen Mesenterium und ein weiterer durch das Foramen von Winslow werden ebenfalls beschrieben und als besondere Bruchtypen kommentiert.

Die Diagnose einer inneren Hernie sollte stets in Betracht gezogen werden, wenn in einem Falle von Darmverschluss die Ursache nicht klar ist. Die zur Stellung der Diagnose erforderliche Zeitspanne sollte zur Verbesserung des lokalen Zustandes des aufgeblaehten Darmes und zur Behandlung des Allgemeinzustandes des Kranken ausgenuetzt werden.

RIASSUNTO

Le ostruzioni intestinali da ernie interne sono rare. Il decorso fulminante ed i risultati disastrosi che conseguono ad un ritardo nella cura operativa richiedono che ogni chirurgo tenga presente la possibilita' di un'ernia interna di fronte ad una sindrome addominale acuta. L'A. descrive brevemente i diversi tipi di ernie interne, di cui presenta una classificazione. Illustra 3 casi del genere. Un primo caso riguarda un'ernia attraverso un difetto del grande omento, con un'insolita iperglicemia (che l'A. considera quale un tentativo fisiologico di difesa contro la rapida perdita di proteine e l'imminente pericolo di uno shock). Nel secondo caso esisteva invece un'ernia dell'ileo attraverso un difetto del mesentere ileo-cecale. Nel terzo un'ernia attraverso il forame di Winslow.

Di fronte ad ogni ostruzione intestinale a causa incerta signota, bisogna tenere quindi presente l'eventualita' di un'ernia interna; il tempo necessario per giungere ad una diagnosi va utilizzato onde migliorare le condizioni locali dell'intestino dilatato e le condizioni generali del paziente.

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Observations on Total Gastrectomy

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DESPITE the fact that total gastrectomy is formidable, it has become a relatively commonplace procedure. Until a comparatively recent date those who attempted the operation found the mortality rate prohibitive. The circumstances that have transformed this operation from a procedure with a prohibitive mortality into one which can be carried out with a low enough mortality to warrant its performance when indicated are the same that have enabled surgery in general to soar to its present heights of attainment. Among the most important are improvements in anesthesia, as well as those in intravenous therapy in general and blood transfusion in particular (as regards both technic and availability of blood); the advent of the sulfa compounds and antibiotics, and the increased knowledge that has resulted in a more intelligent appreciation of the important role played by fluid and electrolyte balance in preoperative and postoperative states.

Practically speaking, the only indication for total gastrectomy is involvement of the stomach by malignant disease to such an extent or in such a location that nothing short of complete removal of the organ can possibly result in satisfactory ablation of the lesion. Although carcinoma is the usual culprit, sarcoma is not unknown, and on rare occasions the lesion, whether tumor or ulcer, that necessitates total gastrectomy for its removal is benign. I have had personal experience of 5 cases in which this operation was performed, and in each of these the lesion was a carcinoma.

In considering the treatment of malignant disease of the stomach it must be borne in mind that, no matter what information has been gleaned from such diagnostic aids as roentgenographic and gastroscopic study, the decision as to whether total gastrectomy is the procedure of choice can be made only after the abdomen is opened and the growth examined. Any surgeon, therefore, who elects to operate upon a patient with malignant disease of the stomach must be prepared to proceed with a total gastrectomy. It follows that an exploratory laparotomy for this condition should be undertaken only by a surgeon who, as a result of his training and experience in gastric surgery, has the necessary skill to perform this operation. There is also the possibility that the disease has spread beyond the confines of the stomach and will necessitate such additional procedures as splenectomy and partial excision of other organs, such as the pancreas, the transverse colon and the left lobe of the liver. These facts cannot be overemphasized. If a surgeon who has not the requisite knowledge and skill attempts to deal with such a situation, one of two equally disastrous courses will be pursued; either the tumor will be deemed inoperable, the patient's only chance of cure being thus eliminated, or a partial gastrectomy will be attempted, a procedure to be thoroughly condemned under these circumstances, as it leads at best to the same result and may even shorten the patient's life by increasing the rapidity of spread, both of the local neoplasm and of its distant metastases. As pertinent to these observations, the following personal case is cited: At operation, although on palpation the pyloric portion of the stomach seemed obviously the seat of neoplastic infiltration, it was not until this portion had been mobilized with the intention of performing a high partial gastrectomy that involvement of the body and fundus by the carcinoma (though nothing like so marked as in the pars pylorica) could be established satisfactorily. Total gastrectomy was then performed, and microscopic examination of the specimen showed invasion by carcinoma cells up to the cardia. This patient survived her operation by nearly four years. A photograph of the specimen (Fig. 1) is of considerable interest. At the level of the incisura a wide, transverse depression formed as the result of healing of a large chronic ulcer. Whether this ulcer was a predisposing or an exciting factor

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in the development of the carcinoma it is impossible to say, but my own interest in the specimen lies in the fact that it is the only one, either operative or postmortem, of a linitis plastica type of gastric carcinoma in which I have ever seen evidence of additional pathologic change, old or recent. This interest is further increased by the fact that several pathologists have reported a similar experience. This specimen may therefore be regarded as something of a pathologic curiosity.

Preoperative Considerations. — Assuming that there is no clinical or roentgenologic evidence of distant metastasis—which would naturally contraindicate any operative procedure—the patient's preparation for surgical treatment must be considered. Efforts should be directed toward bringing him into the best possible condition. The first requisite is a thorough investigation of the patient's various systems, and this should be done by a competent internist. Only in this way can an accurate evaluation of his general condition be arrived at and any deficiencies or complicating factors, such as intercurrent disease, be given appropriate treatment before the operation.

Most patients with malignant lesions of the stomach suffer from some degree of inanition, evidenced by such manifestations as dehydration, hypoproteinemia and anemia, to say nothing of avitaminosis and perhaps other deficiencies which, in the present state of knowledge, may be described as "hidden" since they are not determinable. Hence the use of at least some, and perhaps all, of the present methods of supportive therapy may be necessary to achieve maximum preoperative improvement.

Operation.—Before passing on to a consideration of some of the more important technical aspects of the operation, it should be

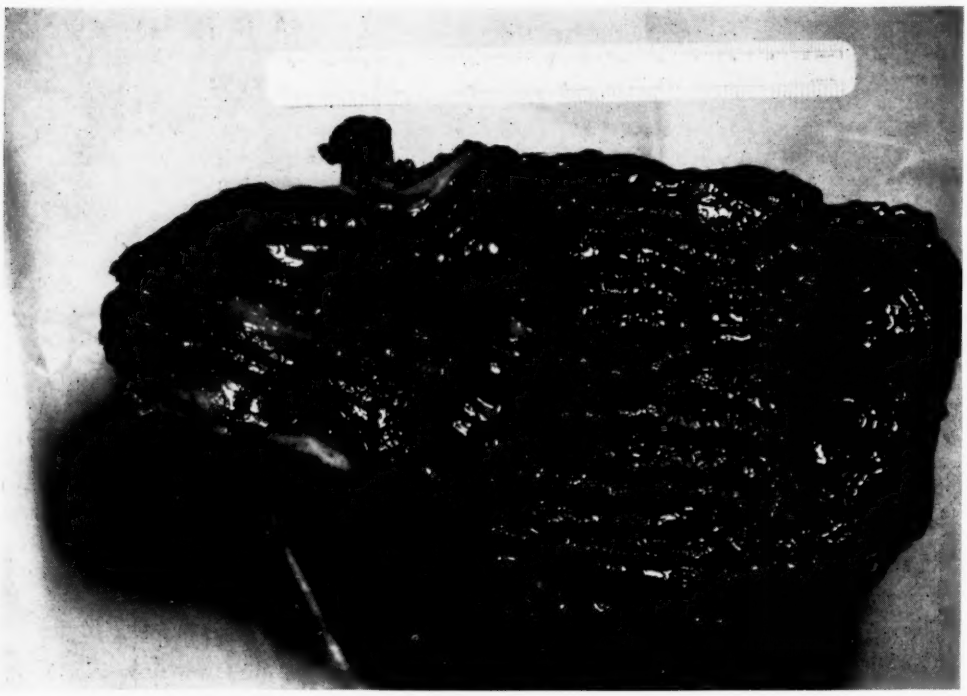

Fig. 1.—Operative specimen. Carcinoma is of infiltrative type, involving whole of stomach. Note broad depressed scar of old healed ulcer.

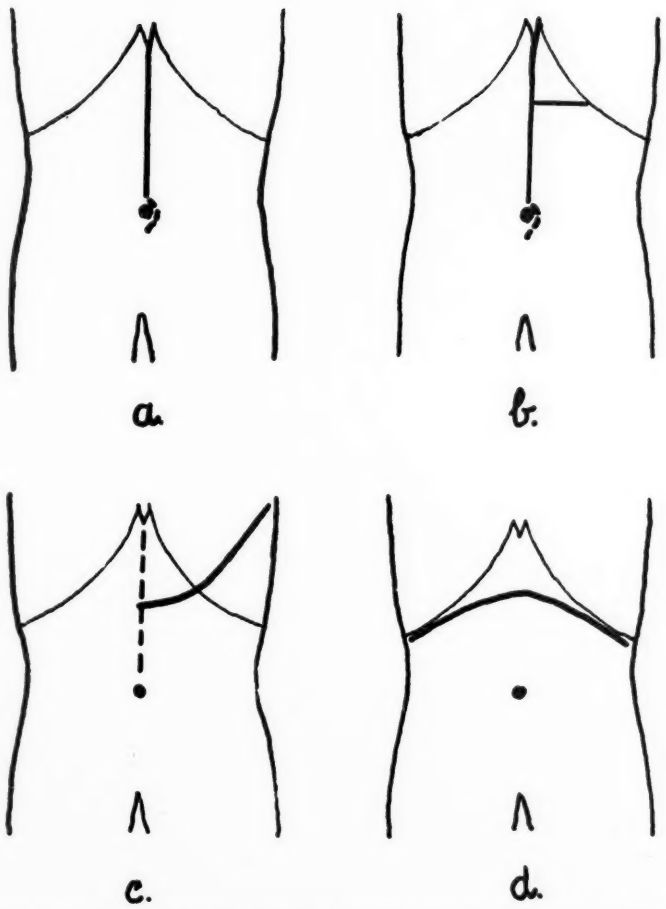

Fig. 2.—Incisions which have been used by the author for total gastrectomy: (*a*) midline supraumbilical, passing upward to left of xyphoid process; (*b*) same, with transverse extension to left; (*c*) thoracoabdominal; (*d*) curved transverse epigastric.

stressed that whenever clinical and other data have indicated the likelihood that nothing less than total removal of the stomach will have to be carried out there should be a plentiful supply of blood available for transfusion. An operation of this magnitude should never be attempted when the availability of blood is in question, and any hospital that is insufficiently equipped in this respect is certainly no place in which to attempt total gastrectomy. Further, it is emphatically desirable to begin the transfusion of blood as soon as the decision has been made in favor of total gastrectomy. One should not wait to institute this measure until loss of blood has begun to show its effects by an increased pulse rate,

falling blood pressure and general instability of the cardiovascular system. It is surely much sounder to anticipate such occurrences if possible, for, once they have occurred, restitution of the patient's condition may become gravely difficult in spite of correct and immediate treatment.

Determining the best possible exposure for total gastrectomy leads to a study of various incisions. In the attempt to evaluate several of these, I have used four types (Fig. 2), namely, a midline supraumbilical incision passing up to the left of the xyphoid process, the same with a transverse extension to the left as far as the costal margin, a thoracoabdominal incision and, finally, a curved transverse epigastric incision with its convexity upward. Although this operation can be performed through any one of these incisions, the better the exposure the more satisfactorily can each successive step be carried out and the less will be the trauma inflicted upon the tissues. The midline incision, with or without its extension to the left, suffers from the great drawback that the costal margin remains rigid and so tends to hamper manipulations in the confined space under the left dome of the diaphragm. (I have not tried additional removal of the xyphoid process, which is regarded by Lefevre[1] as the key to obtaining an "acces facile" to the subdiaphragmatic region.) Moving the incision to the left by making a paramedian incision is of little or no help and may actually increase whatever difficulties present themselves in dealing with the duodenal stump. The most obvious way to overcome the rigidity of the costal margin is to cut through it, and the best method of incorporating this procedure into an incision is to make one of the thoracoabdominal type. This incision, by opening up the eighth or the ninth intercostal space, allows wide separation of the costal margin, a separation which can be increased by incising the diaphragm toward the esophageal hiatus to whatever extent the surgeon finds expedient. In this way excellent access is gained to the space under the left dome. This incision can be looked upon as probably the most satisfactory so far as exposure of the cardia and the abdominal portion of the esophagus is concerned. In the case in which I used it the patient was a stout, thick-set man and it is doubtful if any other incision would have served as well. However, since a total gastrectomy is likely to last from four to five hours, such pulmonary complications as postoperative atelectasis or bronchopneumonia are definite risks entailed by this incision, in spite of the skill with which modern anesthetists utilize intratracheal intubation, intermittent expansion of the lung, etc. If this incision is used, the establishment of the operability of the lesion through the abdominal portion, before the thorax is opened, must be considered a *sine qua non*.

The curved transverse incision was also found satisfactory. Although this does not break the continuity of the costal margin, it frees this margin from its abdominal attachments to such an extent as to cause a material increase in its mobility, allowing it to be retracted anteriorly and upward sufficiently to provide a satisfactory exposure of the cardia. In my opinion, although this incision does not perhaps offer quite so good an exposure as does the thoracoabdominal incision, it is probably not so likely to lead to postoperative pulmonary complications. The choice between these two incisions in any particular case may be difficult. The higher the growth is situated in the stomach, the more I should be inclined to favor the thoracoabdominal approach. In this respect the roentgen data will provide important help.

Some years ago Professor Grey Turner concerned himself with attempts to remove esophageal carcinoma by his so-called "pull-through" operation. So far as I know he was one of the first, if not the first, to divide the left triangular ligament of the liver in order to mobilize the left lobe and so permit its retraction to the right as an aid in exposure of the abdominal portion of the esophagus. On two occasions I found that the division of this ligament was not necessary, but it is certainly a maneuver worth keeping in mind, and in most total gastrectomies it proves to be of great assistance.

From the number of times one reads of splenectomy performed simultaneously with total gastrectomy, one gains the impression that removal of the spleen has become almost a routine with some surgeons. I removed the spleen in only 1 of my cases; some degree of

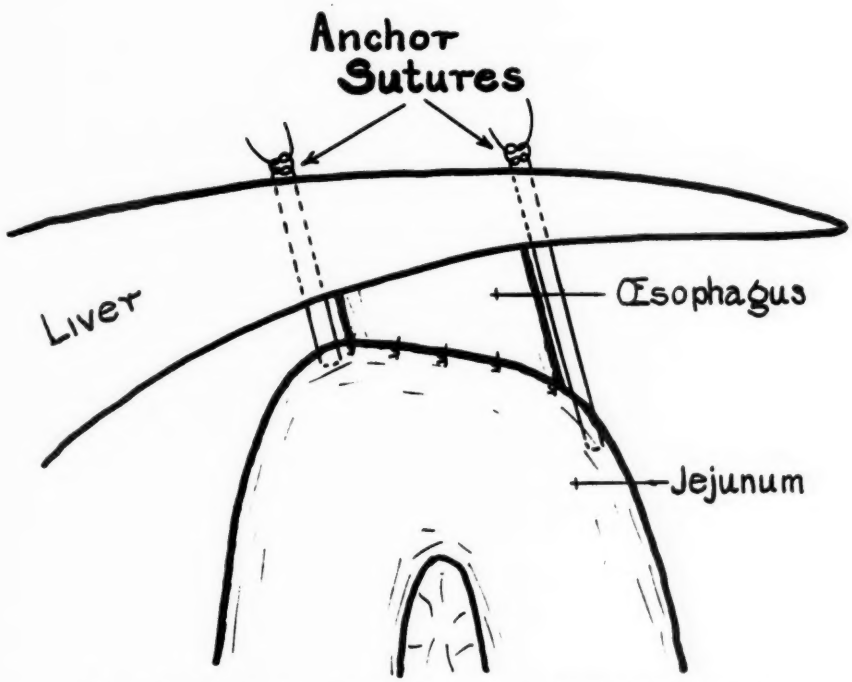

Fig. 3.—Diagram showing method of support for esophagojejunal anastomosis.

perisplenitis was present, resulting in adhesions between the stomach and spleen so that attempts to separate these two organs as the first step towards eventual ligation of the vasa brevia, resulted in tearing of the splenic capsule and pulp, with consequent hemorrhage necessitating splenectomy for its control. If the spleen has become involved in the spread of malignant disease its removal naturally is imperative, but if such involvement has not taken place I am of the opinion that its removal is unnecessary unless its presence creates technical difficulties which cannot otherwise be overcome, or when hemorrhage from the vasa brevia, often difficult to control since it occurs in the depth of the wound, is in the opinion of the surgeon troublesome enough to warrant its control by ligature of the splenic artery. This is customarily accomplished not by ligature in continuity but by the easier method of legating the whole of the splenic vascular pedicle and following this, of course, with splenectomy.

However satisfactorily total removal of the stomach may have been carried out, one must remember that the operation will be a failure unless the anastomosis between the esophagus and the small bowel is satisfactory. The criterion is absence of leakage from the anastomosis; if such leakage occurs, there is little chance of saving the patient's life. The prevention of leakage is therefore of paramount importance, and its achievement depends upon measures, to be discussed presently, which will combat successfully the factors responsible for leakage. A knowledge of these factors is essential. In brief, they are: (*1*) failure to make a water-tight anastomosis, (*2*) inter-

ference with the blood supply to the lower end of the esophagus to such an extent as to cause necrosis and (*3*) tearing out of the sutures with consequent disruption of the anastomosis. In considering these causes one must not forget that an anastomosis which is water-tight when completed, and thus far is a success, will still be a failure if such success has been achieved by use of a technic that results in either the second or third cause of leakage.

From the technical standpoint the aim of the surgeon in performing any anastomosis is to insure that it will be water-tight when completed. No anastomosis can be successful unless it fulfils this basic requirement. This usually implies that circumstances have permitted accurate insertion of the sutures, and in the average anastomosis this is the case. In the anastomosis under discussion, however, there are at least two factors that may have an adverse effect on the suture technic. First, the esophagus is not composed of such strong tissue material as is the bowel and therefore tears more readily; second, exposure of the site of anastomosis is sometimes not all that could be desired. There is nothing one can do to improve the first condition, but knowledge of it should lead to the observance of great gentleness in handling, as otherwise irreparable damage may be done. With regard to the second, the better the exposure of the operative site the greater will be the ease and consequent accuracy with which suturing can be performed. This point has already been given consideration.

Insertion of the posterior rows of sutures is the most difficult part of the anastomosis. In my experience, retention of the stomach at this stage has the advantage of enabling this viscus to be used as a tractor to pull the esophagus gently downward and keep it fixed and steady, thus helping materially to insure the satisfactory insertion of these sutures. Most surgeons appear to agree that this retention of the stomach until completion of the posterior rows of sutures is preferable to its earlier removal and the use of a clamp on the cut end of the esophagus, as was once the customary procedure. When discussing suturing it is perhaps not out of place to mention that it is an easy matter to pleat the end of the esophagus inadvertently when inserting either the outer rows of Lembert sutures or the through-and-through continuous one, and it is probable that this is the most likely cause of the strictures one sees reported from time to time. To have an otherwise satisfactory result marred by such an occurrence is both unfortunate for the patient and embarrassing to the surgeon, especially when it can almost certainly be avoided by the use of lateral stay sutures; with a little tension on these sutures parallel to the line of anastomosis the full width of both posterior and anterior halves of the circumference of the esophagus can be maintained while suturing is in progress.

It is important to realize that the lower end of the esophagus is, at best, relatively poorly supplied with blood. This was well demonstrated many years ago by Demel's investigations on the human esophagus.[2] The blood supply to this portion of the gullet is derived from the following three sources: descending branches of the arteriores esophageae propriae which arise from the aorta or intercostal vessels and enter the esophageal wall above the diaphragm to run downward in the muscularis on their way to ramify in the submucosa; some twigs from the left inferior phrenic artery which descend in a similar manner, and ascending branches from the left gastric artery. The last-mentioned source is the largest; by the time the anastomosis is undertaken, this part of the esophagus has already been deprived of more than one-third of its normal blood supply because of ligation of the left gastric artery. Conservation of the remaining blood supply, consisting only of the descending branches just mentioned, thus becomes a matter of prime importance; comparatively little further damage may suffice to produce one or more areas of necrosis adjacent to the cut edge of the esophagus and thus permit leakage from the anastomosis, an occurrence invariably fatal.

What can be done in the interests of this conservation? In the first place, I consider it important to refrain from separating the esophagus from its diaphragmatic attachments at the hiatus, as is sometimes done in order to allow the esophagus to be drawn further downward into the abdominal cavity. This maneuver deprives the lower end of the esoph-

agus of the blood it ordinarily receives from the left inferior phrenic artery by severing the branches from this source. It also involves the added disadvantage of opening up the connective tissues of the mediastinum, a result which, although admittedly not fraught nowadays with the serious danger that used to attend it in the presulfonamide and preantibiotic era, nevertheless stamps this procedure as both undesirable and unnecessary. Second, it must be remembered that the outer rows of Lembert sutures can be inserted in such a way as to interfere seriously with the blood supply. This can usually be averted by taking care that these sutures are interrupted and that vertical bites of esophageal wall are taken, so that the sutures lie parallel to the descending blood vessels; otherwise any of these underrun by a transverse bit would be occluded immediately on the tying of the suture.

Tearing out of the sutures which consequent disruption of the anastomosis can result from one of two causes, either tension or drag due to the weight of the jejunum. So far as the former is concerned, there is so much jejunum available that it seems ridiculous to find the question of tension arising at all. Yet it can easily do so if, when one is determining the length of the loop of the jejunum between the duodenojejunal flexure and the cut end of the esophagus, due allowance is not made for the shortening effect of suturing. Hence one should always remember to err on the generous side in deciding the length of that portion of the jejunum which will form the afferent loop. The fear that the weight of the jejunum may produce sufficient drag on the anastomosis to cause tearing out of the sutures had led surgeons to consider it advisable to furnish the anastomosis with some form of support. Attachment of the jejunum to the diaphragm has been perhaps most often suggested, but I have always been impressed by the considerable distance between the diaphragm and the completed anastomosis, a circumstance which led me to adopt a different form of support. This is shown diagrammatically in Figure 3. It consists of placing a Lembert suture of plain No. 0 catgut through the jejunum just lateral to the anastomosis on each side, threading each end in turn through the substance of the left lobe of the liver and then tying them on its superior surface, tightly enough to draw the jejunum into contact with the inferior surface. Anchoring the jejunum to the liver provides the anastomosis with a support possessing the dual merits of simplicity and efficiency.

Cases have been reported from time to time in which the continuity of the alimentary tract after total gastrectomy was restored successfully by an end-to-end anastomosis between the esophagus and duodenum. Although esophagoduodenostomy effects a more physiologic restoration of continuity than esophagojejunostomy, the main factor that militates against its frequent performance is the difficulty of insuring the absence of tension between the cut ends. When this difficulty can be overcome, esophagoduodenostomy is a rational procedure, and surgeons regard it with enthusiasm. It seems probable, however, that its applicability will remain limited to a minority of cases; the anatomic configuration in the majority of patients is such that mobilization of the duodenum, although carried out to the fullest possible extent, does not permit its cut end to be brought into apposition to that of the esophagus without tension. Such at least has been my experience.

An important question that always arises after completion of the esophagojejunostomy is whether to perform an enteroanastomosis between the afferent and efferent loops of the jejunum. I still feel there is much to be said for a remark I made in a previous communication:[3] "Its omission has not prevented a successful outcome in many a case nor, on the other hand, has it performance by any means always prevented a fatal outcome," so that it cannot be regarded as absolutely essential. However, many surgeons (among whom I must include myself) appear to consider it a worthwhile procedure and prefer not to omit it. There are two reasons to justify this decision. First, it allays whatever fears one may have that its absence will result in distention of the long proximal loop in the early postoperative period, causing rupture of the recently inverted duodenal stump. Second, decompression of this loop by such an anastomosis prevents stagnation of food and bile within it and thus adds much to the patient's comfort. Consequently it has always been my practice to perform this anastomosis after completion of

the esophagojejunostomy, placing it on the afferent loop just distal to the duodenojejunal flexure, below the opening in the transverse colon through which the jejunal loops pass.

I was much interested to learn recently from Lahey,[4] who once favored the omission of esophagojejunostomy, that he had decided some years ago to adopt the procedure because of the development of esophagitis in cases in which it had been omitted.

Postoperative Conditions.—Since satisfactory healing of the esophagojejunostomy is of such great importance and the surest way of promoting it is by rest, food by mouth should be withheld for the first few days. This means that efforts must be directed toward the maintenance of physiochemical values within normal limits until the patient can tolerate a normal diet. Although as a rule these efforts consist solely of intravenous therapy, I should like to draw attention to a somewhat neglected procedure—tubal alimentation—as a worth-while aid to the successful postoperative maintenance of normal physiochemical values. Just prior to the completion of the esophagojejunostomy a Levine tube is passed down the esophagus and guided through the anastomosis into the efferent loop of the jejunum for a few inches. A tube so placed has two important advantages: Not only can it be used for feeding, but should any indication for suction arise this can be applied without further trouble or delay. Through this tube predigested food can be introduced directly into the intestinal tract, the important feature of this food being that it contains all the dietary elements (in marked contrast to intravenous solutions, which are lacking in most of them). It is an easy matter to have this predigested food compounded of a balanced formula, 1 cc. representing 1 calorie; thus, 1,000 cc. will furnish 1,000 calories as opposed to the 400 calories present in a similar quantity of 10 per cent dextrose solution or the 200 to 300 calories supplied by a liter of protein derivative solution. However, one must realize that this type of tubal alimentation has quantitive limitations and cannot be regarded as comparable to feeding through a gastrostomy tube, with which 4 or 5 ounces of formula may be introduced in a few minutes without any distress to the patient. Should a rapid rate of drip be started, after some 20 or 30 cc. has been introduced the patient will usually complain of pain in the upper part of the abdomen, apparently due to sudden distention of the jejunum, and another hour or so may pass before any more formula can be given. Hence it is preferable to use a continuous but slow rate of drip aimed at introducing 1 to 1.5 liters in twenty-four hours, as this is approximately the maximum amount that can be introduced without upsetting the patient. Whatever additional water is considered necessary may be supplied intravenously or, since the introduction of alidase, may be given painlessly by hypodermatoclysis if the former route should present undue difficulties, as on occasion it may. If all goes well the tube should be removed about the fifth day, after which the patient is given clear fluids by mouth, frequently and in small quantities e.g., 1 ounce every fifteen to thirty minutes. Once this postoperative stage has been reached it is gratifying to observe how quickly the diet may be increased with no discomfort to the patient.

Other postoperative measures to increase the patient's resistance to infection, such as the administration of antibiotics and vitamins, have become more or less routine practice.

A striking feature noted by many authors is that patients who recover from the operation usually enjoy an extraordinarily smooth convalescence considering the severity of the procedure. Should the abdomen become the seat of trouble, experience indicates that the esophagojejunostomy has not been satisfactory and that leakage has occurred, with its resulting peritonitis and gloomy prognosis.

SUMMARY

Certain observations are made on some of the more important and, in some instances, controversial features encountered in the preoperative, operative and postoperative aspects of total gastrectomy in the hope that they may prove of practical value, especially to those who have not yet essayed this rigorous surgical exercise.

RÉSUMÉ

L'auteur rapporte son expérience personnelle avec les différents aspects préoperatoires,

opératoires, et postopératoires de la gastrectomie totale.

La laparotomie exploratrice pour les maladies malignes de l'estomac ne doit être entreprise que par un opérateur de grande expérience en chirurgie gastrique car la gastrectomie totale qui peut être le traitement de choix dans certains cas est une opération d'une magnitude beaucoup plus grande que l'ablation partielle de l'estomac.

L'auteur recommande la transfusion sanguine immédiatement après avoir décidé de soumettre le malade à une gastrectomie totale au lieu d'attendre que l'hémorragie ait détermine une influence nocive sur le système cardiovasculaire.

L'auteur discute les différents stades opératoires: division du ligament triangulaire du foie, ésophagojéjunostomie, duodénejéjunostomie et jéjunojejunostomie.)

Les causes de fuite après une esophagojéjusnostomie et les mesures pour combattre cet accident sont considérées.

La splénectomie est discutée en rapport avec la gastrectomie totale.

L'emploi d'alimentation tubaire est recommandé pour le traitement postopératoire.

ZUSAMMENFASSUNG

Der Verfasser berichtet seine auf eigener Erfahrung mit totaler Magenresektion beruhenden Beobachtungen und geht hier und da auf die strittigen Fragen ein, die sich in praeoperativer, operativer und postoperativer Hinsicht ergeben.

Er betont, dass Probelaparatomien wegen boesartiger Magenerkrankungen nur von erfahrenen Magenchirurgen vorgenommen werden sollten, da die totale Magenexstirpation, die sich in jedem einzelnen Falle als die Behandlung der Wahl herausstellen mag, ein Eingriff von viel groesserem Umfang als eine Teilresektion des Magens ist.

Der Verfasser hebt hervor, dass es ratsam ist, mit Bluttransfusionen unverzueglich nach der Entscheidung fuer eine totale Magenresektion zu beginnen, anstatt zu warten, bis eine Blutung das Kreislaufsystem unguenstig beeinflusst haben mag.

Unter den technischen Punkten, die der Verfasser bespricht, finden sich Fragen des Einschnitts, die Trennung des linken dreieckigen Leberligaments, die Oesophagojejunostomose, die Duodenojejunostomose und die Jejunojejunostomose.

Die Ursachen fuer Undichtigkeiten in Oesophagojejunostomosen und die Mittel, sie zu bekaempfen, werden beruecksichtigt.

Die Milzresektion in Beziehung zur totalen Magenexstirpation wird eroertert. Die Schlauchernaehrung findet als wertvolles Verfahren in der postoperativen Behandlung besondere Erwaehnung.

RIASSUNTO

Traendo argomento dai risultati della propria esperienza nel campo delle gastrectomie totali, l'A. espone e discute alcuni punti controversi riguardo le cure preoperative, operative e postoperative. Richiama l'attenzione sopra la necessita' che le laparatomie esplorative per tumori maligni dello stomaco vengono intraprese solo da chirurghi veramente esperti di chirurgia gastrica dato che la gastrectomia totale—che puo' diventare in taluni casi l'operazione di elezione—e' un'operazione molto piu' estesa e complicata della gastrectomia parziale.

L'A. ritiene inoltre che le trasfusioni di sangue debbano essere iniziate subito dopo la decisione di una gastrectomia totale: le emorragie influirebbero infatti dannosamente sopra il sistema cardio-vascolare, annullando quindi i vantaggi delle trasfusioni.

Nella discussione sopra la tecnica operatoria, l'A. include: il tipo di incisione; la divisione del legamento triangolare del fegato; l'esofago—digiunostomia; la duodeno—digiunostomia; la digiuno—digiunostomia.

Vengono discusse le cause di una non perfetta riuscita dell'esofago—digiunostomia e le misure atte a migliorare i risultati dell'anastomosi. L'opportunita' di una splenectomia viene pure vagliata.

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A Nonrigid Method of Treatment for Early Clubfoot

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ADHESIVE traction employing gum mastic, ether and flannel bandages demonstrated its effectiveness in the treatment of early clubfoot more than twenty-five years ago. Nevertheless this method failed to gain general favor, because of its messiness. The majority of orthopedists still treat early talipes with repeated plaster casts.

The following nonrigid, semi-elastic procedure, which I have employed with excellent results in more than 100 cases, retains the advantages of gum-mastic adhesive traction without its drawbacks. In the absence of muscular or bony deficiency, even the worst clubfoot can be brought into extreme overcorrection in three to six weeks and the overcorrection easily maintained thereafter.

TECHNIC

Moleskin adhesive, flannel bandages and ordinary adhesive tape are the only materials required. At the first strapping three strips of moleskin are applied, 1 inch (2.5 cm.) wide and varying in length from nine to twelve inches (22.5 to 30 cm.). The first strap starts on the dorsum of the foot at the base of the fifth toe, is carried over the foot to the middle of the first toe and brought underneath to the fifth toe. The foot is then forced into a slightly corrected position, after which the moleskin is carried up the outer aspect of the leg, passed over the flexed knee to the inner or posterior aspect, and brought down to the midcalf (Fig. 1*A*). This strap easily maintains the slightly corrected position of the foot.

The second strap starts just above the inner malleolus and passes down around the heel, which is forced into slight correction; then it also is carried up the outer aspect of the leg, over the knee to the inner aspect, and down to the midcalf (Fig. 1*B*).

The third strap starts on the dorsum of the foot, between the other two, at the metatarsotarsal joint, crosses the dorsum to the inner side, goes underneath the foot to the base of the fifth metatarsal and is spiraled around the calf of the leg up to the knee (Fig. 1*C*). The strapping is then covered with a flannel bandage, held in place with adhesive tape.

After strapping, the patient is kept under observation for half an hour to an hour to make sure that there is no interference with circulation. Should the toes turn blue or white, the dressing must be loosened. The parents are instructed to keep a strict watch on the toes for blanching or cyanosis and to report any signs of either immediately. However, it is advisable for the orthopedist to make a personal check on the following day. The feet are kept in elevation.

Two days after the original strapping, three strips of ordinary adhesive tape are applied over the flannel bandage in the same manner as the moleskin, increasing the correction. Another correction is made two days later.

The following week and every week thereafter until the desired degree of overcorrection is attained, the complete dressing is removed and the entire procedure repeated. Usually three to six weeks suffice to bring the foot into extreme calcaneovalgus, with the equinovarus greatly overcorrected and the dorsum of the foot lying on the outer aspect of the leg.

About 10 per cent of patients are susceptible to irritation of the skin during this phase of treatment. Should it occur, the use of moleskin must be discontinued and only flannel bandages used until healing takes place.

Once the foot is in calcaneovalgus, a circular strap across the forefoot and the calf of the leg is sufficient to maintain the overcorrection (Fig. 1*D*). This type of strapping is repeated first weekly, then biweekly, then every three weeks and finally once a month.

By the fourth and fifth month the patient may be permitted to go without strapping for several days at a time. The bandage-free interval is gradually increased: by the seventh month, as a rule, strapping is applied only once every six weeks and kept on for only a week or ten days at a time.

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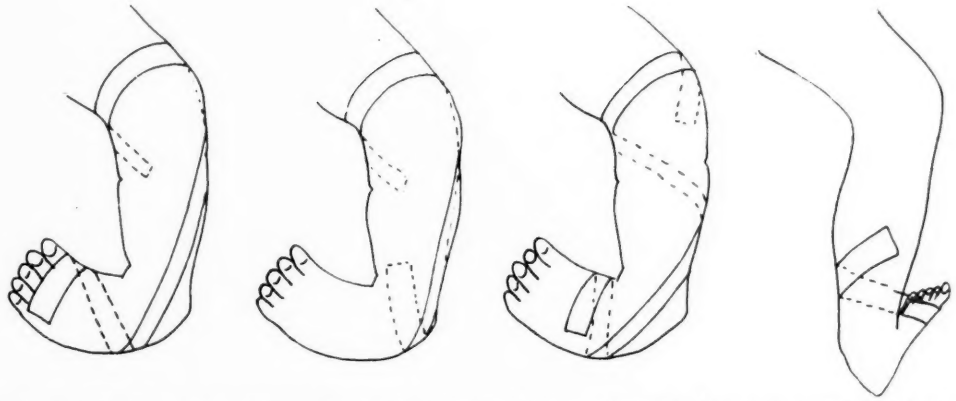

Fig. 1.—Application of straps. *A*, first strap, started on dorsum at base of fifth toe, is carried over foot to middle of first toe and brought underneath to fifth toe. After slight correction of position of foot, strap is carried up outer aspect of leg, above flexed knee to inner or posterior aspect, and down to midcalf. *B*, second strap, started just above inner malleolus, is carried down around heel and, after slight correction of latter, is continued up outer aspect of leg, etc., like first strap. *C*, third strap, started on dorsum at metatarsotarsal joint, is carried across dorsum to inner side, goes underneath foot to fifth metatarsal and is spiraled around calf up to knee. *D*, circular strap across forefoot and calf of leg to maintain overcorrection once foot is in calcaneovalgus.

Once the child is able to walk, strapping is entirely discontinued and replaced with corrective shoes. However, frequent observation is advisable over a period of several years to guard against a return of the deformity. Occasionally the forefoot may go into slight varus. This is correctible by a special night brace. All in all, at least three years must elapse before the condition can be considered permanently cured (Figs. 2, 3, 4, and 5).

COMMENT

The method of nonrigid, semi-elastic traction here described has many advantages over the use of plaster casts. A full strapping takes only a quarter of the time required for the application of plaster and causes less discomfort to the patient. It is more easily removed.

Whereas plaster casts are usually changed once a week at most, more usually every ten days or two weeks, with adhesive traction the

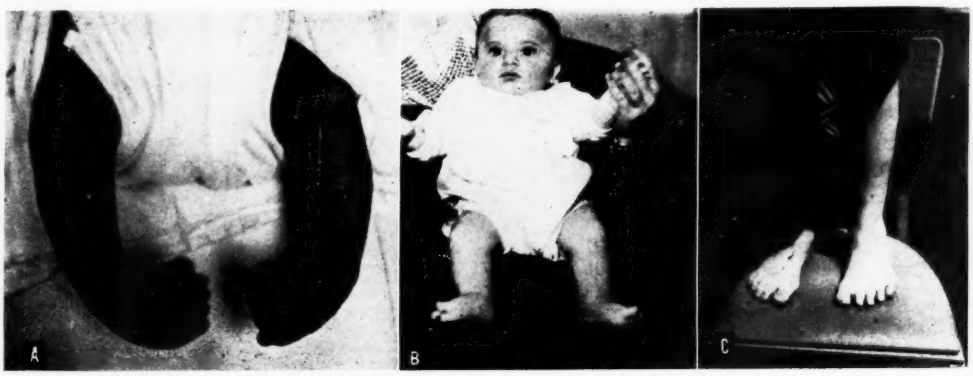

Fig. 2.—*A*, bilateral clubfoot in 2-day-old boy. Complete overcorrection obtained in eighteen days. *B*, overcorrected foot four and a half months after start of treatment. *C*, condition at age of 8½ years; no evidence of clubfoot.

degree of correction can be increased every two or three days. Thus overcorrection is accomplished in three to six weeks, as compared to approximately three months with plaster.

Except for occasional cutaneous irritation, the moleskin strapping produces no adverse effects. In contrast, the use of plaster casts frequently results in severe atrophy. Often

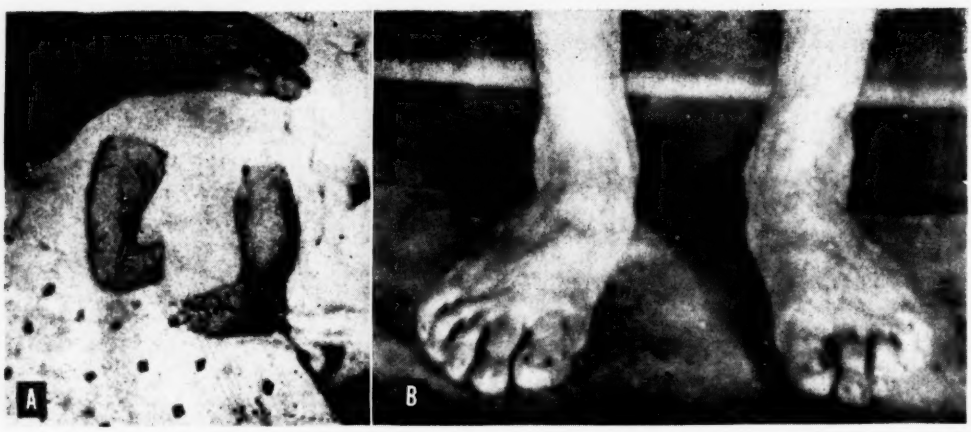

Fig. 3.—*A*, bilateral clubfoot in boy aged 6 weeks on whom unsuccessful attempts at correction had been made elsewhere with plaster casts. Treatment by method described brought feet into extreme valgus in ten days. Slight varus of forefoot, observed two years later, corrected by manipulation. *B*, same boy, at age of 16 years, with marked pronation of feet; treated with arch supports and corrective exercises. No evidence of clubfoot.

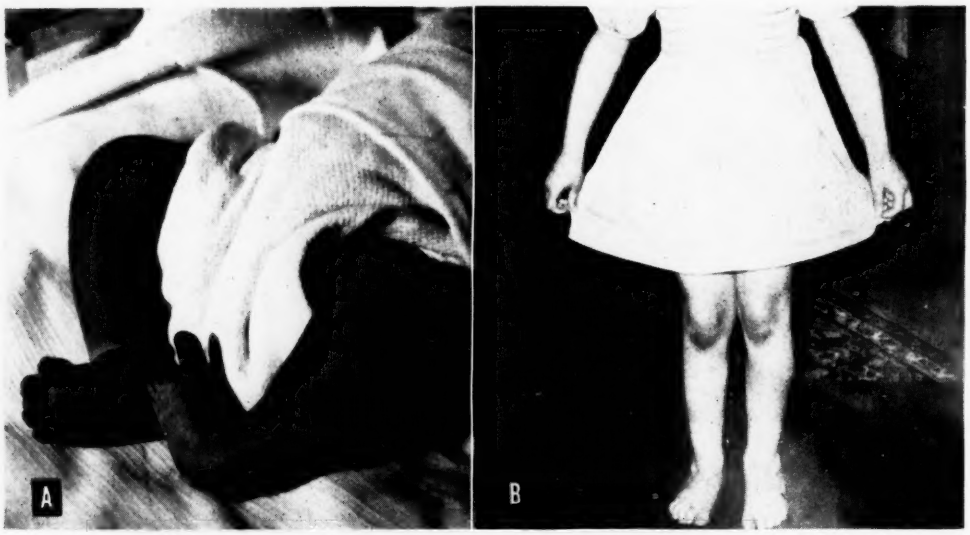

Fig. 4.—*A*, left clubfoot and varus of right great toe in girl 1 day old. Within three and a half weeks the left foot was in extreme calcaneovalgus. Repeated strappings applied for two and a half months, when family left city and child no longer came for treatment. One year later, return of equinovarus and shortening of tendo achillis observed; heel in varus. Equinovarus corrected by resumption of strapping. In view of tendency to recurrence, wedged casts applied over adhesive tape to maintain position. Varus of heel completely corrected within two and a half years; tendency toward varus of forefoot overcome by means of special brace. *B*, child at age of 6, with no evidence of clubfoot or varus of forefoot.

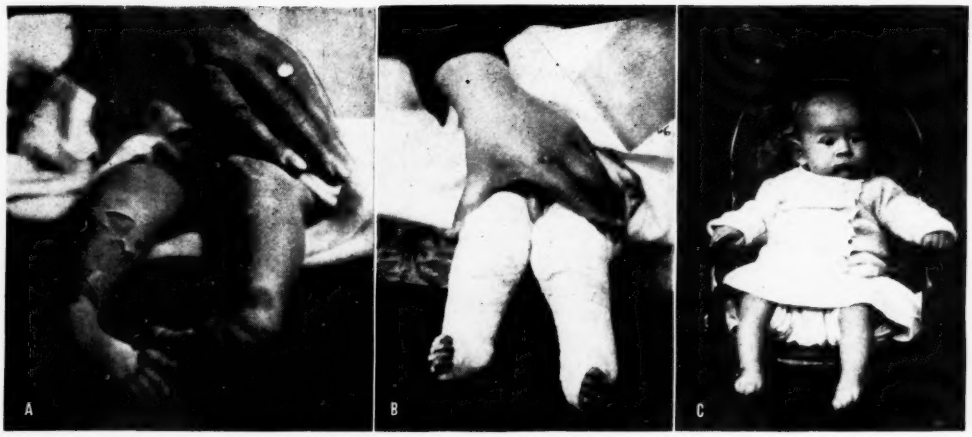

Fig. 5.—*A*, bilateral clubfoot with irritation of the skin in a boy aged 2 weeks. Repair deferred till healing of skin. *B*, one month after beginning of treatment; feet in extreme overcorrection. C, three months after beginning of treatment. Until his death from pneumonia at age of 2 years, child walked normally without any sign of deformity.

the heel turns into varus within the cast.

The cohesive gauze bandages sometimes used instead of plaster have many of the latter's disadvantages. They do not stick to the legs, and the heel can turn within the bandage as it does within a cast. However, these bandages can be used instead of flannel in the technic of adhesive traction.

SUMMARY

The author describes his method of treating early clubfoot by nonrigid, semielastic traction, with which he has been able to bring even severe deformity into extreme overcorrection in three to six weeks, provided there is no muscular or bony deficiency. The overcorrection is easily maintained thereafter.

The advantages of this method over the use of plaster casts are stressed.

ZUSAMMENFASSUNG

Der Verfasser beschreibt seine Behandlungsmethode des fruehzeitigen Klumpfusses durch nichtstarren, halbelastischen Zug, womit er in der Lage ist, selbst Faelle von schwerer Deformierung innerhalb von drei bis sechs Wochen in aeusserste Ueberkorrektionsstellung zu bringen, vorrausgesetzt, dass kein Muskel—oder Knochendefekt vorliegt. Die Ueberkorrektion laesst sich dann leicht aufrechterhalten. Es werden die Vorteile dieser Methode gegenueber der Anwendung von Gipsverbaenden hervorgehoben.

SOMMAIRE

L'auteur décrit sa méthode de traitement du pied bot peu avancé par une traction non rigide semi-élastique; avec cette méthode, il a converti des cas très séverès de difformité en surcorrection extrême. Le traitement dura de trois à six semaines, pourvu qu'il n'y eût aucune déficience musculaire ou osseuse. La correction exagerée est facilement maintenue après ce laps de temps.

Les avantages de cette méthode sur l'emploi des attelles en plâtre sont très évidents.

RIASSUNTO

L'A. descrive il proprio metodo di cura per il piede equino, varo, valgo. Mediante una trazione non rigida, semielastica, questo metodo consente in un periodo da 3 a 6 settimane un'ipercorrezione anche delle deformita' piu' gravi qualora non esistano deficienze ossee o muscolari. L'ipercorrezione viene poi mantenuta facilmente. Vengono infine discussi i vantaggi della trazione sopra l'ingessatura.

Gallstone Ileus

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GALLSTONE ileus is a relatively uncommon but decidedly important condition causing intestinal obstruction. Prior to 1928, only 78 cases were reported in the roentgenologic literature, and among these the diagnosis was made preoperatively only in the exceptional case. In recent years, with improved roentgen technic and a more attentive cognizance of the condition, the diagnosis is being made in many more cases. Given an elderly woman with long-standing biliary disease in whom intestinal obstruction develops either suddenly or gradually, the clinican may suspect the possibility of gallstone ileus, and the roentgenologist may prove it. Even in cases in which the symptoms do not fall into a definite pattern a correct diagnosis may be made by the roentgenologist.

The unusual occurrence of this condition in a comparatively young male patient with vague symptoms justifies adding another case to the rapidly growing literature. The importance of early diagnosis for a favorable prognosis, as well as the high mortality rate—varying from 50 to 90 per cent—associated with delay in diagnosis, necessitates constant awareness of the possibility of this disorder.

Gallstone ileus is primarily a disease of elderly women. In a series of cases reported by Hinchey[1] and another reported by Balch,[2] the average age was 66 and the youngest patient about 50 years of age. Women outnumbered men in the ratio of about 15 to 1.

Pathogenesis.—The pathogenesis is not clearly established. In the majority of cases a cholecystoenteric fistula exists. Occasionally, stone ileus may be due to the passage of a stone through the common duct. However, it is a matter of conjecture whether a normally passing stone can produce obstruction. The predisposing factor is usually an attack of acute cholecystitis and pericholecystitis with adhesion formation between the gallbladder and an adjacent viscus. Obstruction of the common duct by a stone with a patent cystic duct initiates the formation of a fistula. Acute or chronic inflammation of the gallbladder sets in; adhesions form, and fistulization follows. Recurrent attacks of intestinal colic with partial impaction of the stone may then take place. Fistulas occur most often between the gallbladder and the duodenum. Somewhat less frequently they form between the gallbladder and the colon, and still less commonly they occur between the gallbladder and the stomach or between the common duct and the intestine. In the formation of cholecystocolic fistulas, neoplasm takes precedence as a causative factor; in that of choledochoduodenal fistulas, ulcers play the primary role. There have been occasional reports of emptying of the stones into the bronchial tree, the precardial sac, the pelvis of the kidney and the uterus, respectively.

With the passage of the stone the fistula may close off completely, so that at a later date only dense adhesions are observed. In many patients examined at autopsy no fistulous tract has been observed. The stone may lodge in the intestine for months, even for years, before obstruction develops. When obstruction occurs it is usually in the ileum, where the small intestine is relatively narrow. Many factors besides the size of the stone influence the occurrence of obstruction. The type and number of facets or edges of the stone, kinks in the bowel, the rate of peristalsis or ulceration in the bowel wall may precipitate obstruction. Passage of a stone with facets should suggest the possibility that other stones have been left in the intestine. A stone may be the cause of a volvulus or intussusception. The largest stone removed was described by Turner.[3] It weighed 155 Gm. and measured 7 by 6 by 17 Cm.

Symptoms.—There may be no symptoms prior to acute intestinal obstruction, or, on the other hand, the history may be suggestive. At

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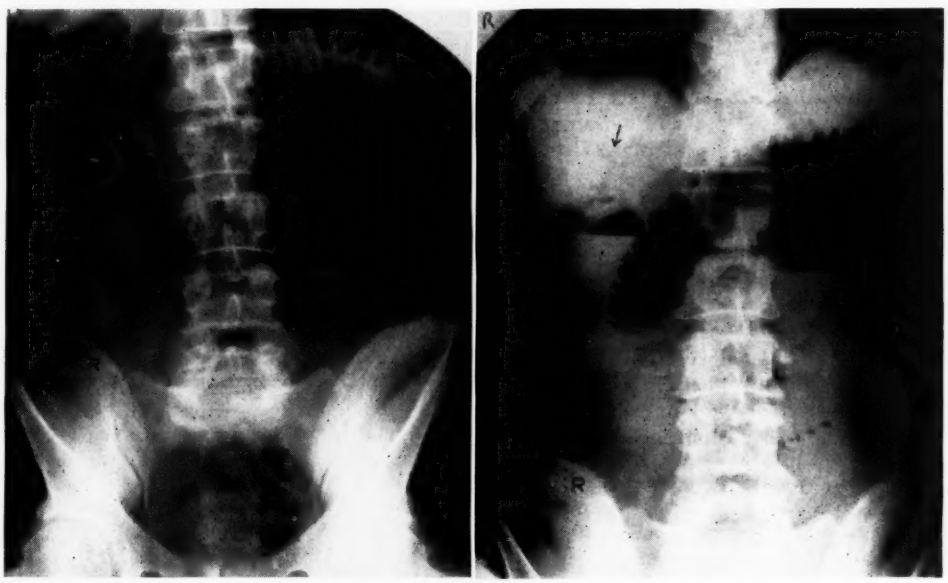
any one time the symptoms may be referable to disease of the gallbladder, to migration of the stone into the intestine or to intestinal obstruction itself. In approximately 50 per cent of reported cases a hisory of longstanding chronic disease of the gallbladder or of recurrent attacks of acute cholecystitis is recorded. When the stone passes into the intestine, severe pain with or without vomiting may be present in the upper part of the abdomen. During passage of the stone through the tract, temporary ileus with nausea and vomiting may occur. These bouts may recur repeatedly for years until final obstruction takes place. With the formation of a spontaneous internal biliary fistula, the attacks of intermittent gallbladder pain and jaundice may cease. Despite the presence of a fistula, clinical cholangitis is infrequent. Should the fistula involve the colon, diarrhea, cramps, emaciation, fever and chills occur commonly. Symptoms of intestinal obstruction in varying degrees are present in 50 per cent of the cases; some form of chronic cholecystitis is present in the majority. When an elderly woman presents herself with a story of long-standing disease of the gallbladder and a bizarre type of intestinal obstruction, the diagnosis may be suspected.

Physical Signs.—Physical examination gives inconclusive results in the majority of cases. Distention is only moderate, and tenderness is late. A mass is rarely felt. If the fistula occurs high in the intestine, vomiting may be a leading symptom. Evidence of dehydration with obstruction of the upper part of the bowel may be present. The formation of a fistula may simulate a typical attack of disease of the gallbladder, with pain and tenderness. However, obstruction is usually intermittent, and few physical observations are noteworthy until it becomes complete. Since many stones pass spontaneously through the rectum, obstruction may never be complete.

Diagnosis.—Clinically, the diagnosis of gallstone ileus is not tenable without roentgen confirmation. Preoperatively the diagnosis may be suspected if gallstone disease is of long standing and a bizarre type of obstruction is present. To impart authority to mere suspicion, certain roentgen features are of importance.



Illustrative roentgenograms.

The following roentgen signs point to the diagnosis:

1. Air or a contrast medium in the biliary tract
2. (*a*) Direct visualization of the stone or (*b*) Indirect visualization of the stone by means of a contrast medium in the intestine (stones are not visualized often in the intestine, since their chemical composition is chiefly cholesterol; about 80 per cent are not radiopaque)
3. Change in position of a stone previously observed
4. Roentgen appearance of partial or complete intestinal obstruction.

Obstruction of a functional gallbladder negates the diagnosis of fistula and ileus due to stones. Therefore, if time permits, the corroborative feature of a nonfunctioning gallbladder is important. If a cholecystocolonic fistula is suspected, a barium enema study may demonstrate reflux in the biliary tree.

Treatment.—Treatment of this condition requires nicety of judgment and taxes the versatility of the surgeon. The recent addition of suction drainage may complicate rather than simplify the problem. Valuable time may be lost by repeated and prolonged attempts at decompression of the small bowel. If operation is delayed too long, perforation of the intestine proximal to the stone may occur. The operation should be done when the progress of the stone is stopped and more or less complete obstruction of the bowel exists. If circulatory changes are suspected or if abdominal tenderness with leukocytosis, fever or increased pulse rate is present, surgical treatment is indicated.

The treatment of choice is simple enterotomy with removal of the stone. If facets are present on the stone, a search for sister stones must be conducted. If obstruction is marked, a Miller-Abbott tube will help in preoperative decompression of the small intestine. Operation on the gallbladder is not indicated at the time of removal of the stone. Even after the patient has recovered from gallstone ileus, operation on the fistulous tract is difficult and ill advised. Many fistulas close spontaneously. Should cholangitis follow or altered hepatic function appear, a fistulectomy may have to be done. McQueeney[4] cited 2 instances of cholecystoduodenal biliary fistulas, of fifteen and nineteen years' duration respectively, without evidence of cholangitis. The majority of patients are old and infirm, and closure is hazardous. With a cholecystocolonic fistula, cholangitis is more likely to develop; in such circumstances closure may be desirable if the patient's condition permits.

The following case presents certain features of clinical, roentgenologic and therapeutic importance.

REPORT OF CASE

J.G., a 53-year-old white man, was first seen on June 12, 1949, with a history of intermittent hypogastric and periumbilical cramplike pains of three weeks' duration. These had become progressively more severe during the past few days, during which he had bouts of vomiting occurring one to three hours after meals. The emesis contained gross foods or bile. For four days the patient had had no bowel movement even after an enema. There was no antecedent history of cholecystic disease, colic or jaundice. No altered qualitative or quantitative food intolerance was demonstrable.

Of the common childhood illnesses, the patient had had scarlet fever only. In 1936 he had hematuria. On cystoscopic examination a small papillomatous growth was noticed. Since biopsy suggested that the tumor was benign, it was treated by fulguration. In 1938 a recurrence of the symptoms necessitated cystoscopic study, and a tumor on the floor of the bladder was noted. A biopsy at this time revealed a papillary carcinoma, which was treated again by fulguration. The patient was well for ten years. In January 1948 a reactivation of his symptoms necessitated further cystoscopic procedures. A papilloma on the anterior wall of the bladder, behind the vesical neck, was revealed. This was treated by resection of a portion of the bladder. The postoperative course was uneventful. Three weeks after discharge the temperature became elevated, and a sharp, colicky pain was felt in the right upper quadrant of the abdomen. A roentgenogram of the chest suggested a pneumonic patch. Treatment with antibiotics effected complete recovery within one week. After his discharge from the hospital the patient went on a vacation, during which there occurred an occasional mild bout of pain in the right upper quadrant, vomiting and fever without jaundice. Three weeks prior to admission to the Post Graduate Hospital the present complaints developed.

Physical examination on admission revealed the patient to be in acute distress. His abdomen was

slightly distended, and he showed evidence of moderate dehydration. Except for an abdominal scar low in the midline and the aforementioned slight distention, abdominal examination revealed no abnormality. Peristalsis was prompt and hyperactive. No tenderness or rebound was elicited, and no masses were left. On admission the temperature was 100 F., the pulse rate 90 and the blood pressure in millimeters of mercury 130 systolic and 90 diastolic.

Laboratory studies revealed the following values: urea 30 mg., blood sugar 200 mg., blood chloride 446 mg., total proteins 7 mg., albumin 4.6 mg. and globulin 2.4 mg. per hundred cubic centimeters. The value for carbon dioxide was 65 volumes per cent. The specific gravity of the urine was 1.027. No sugar was present, and there was no albumin. Microscopic examination gave negative results.

The erythrocyte count was 5,400,000 per cubic millimeter of blood, with 82 per cent hemoglobin. The hematocrit reading was 37 per cent. The leukocyte count per cubic millimeter of blood was 11,800, with 50 per cent polymorphonuclear cells, 40 per cent lymphocytes and 4 per cent stab cells. On administration of intravenous fluids the value for urea fell to 18 mg. per hundred cubic centimeters; later the white blood cell count was 10,050 per cubic milimeter, with 24 per cent lymphocytes, 7 per cent monocytes and 15 per cent stab cells.

Roentgen Examination.—A flat plate of the abdomen revealed an obstruction in the midjejunum. No radiopaque stones were noted. There was air in the biliary tree; this was not noticed prior to the operation but was evident in retrospect.

The patient was treated by intravenous therapy to correct the electrolytic imbalance and mild alkalosis. A Miller-Abbott tube was introduced. After twenty-four hours the symptoms persisted, and, because of a rising temperature and pulse, an increased shift to the left in the polymorphonuclear cell count and slight abdominal tenderness, an operation was deemed advisable. A left rectus incision was made, and the stone-containing small bowel was delivered easily. Enterotomy was performed, and a small egg-sized smooth stone measuring 2½ by 1 by ¾ inches (3.9 by 2.5 by 1.8 cm.) was removed. Palpation revealed a dense adhesive mass in the right upper abdominal quadrant, but no surgical attack on this area was initiated. The immediate postoperative course was uneventful. Three weeks later there was a sudden attack of fever, chills and jaundice, with alteration of the urine and stools. This attack, apparently cholangitis, was treated conservatively with antibiotics, a protein-high carbohydrate diet and vitamins. Tests of liver function showed a 4 plus cephalin flocculation reaction and a positive result from the thymol turbidity test. There have been no recurrent attacks, and for the past year roentgen studies have revealed no obvious fistula. Tests of liver function have given consistently normal results. At present no further surgical intervention is contemplated.

COMMENT

The occurrence of gallstone ileus in a comparatively young male patient is most unusual. The attack of pain in the right upper abdominal quadrant with fever, which was interpreted as pneumonia, in all probability was the pain associated with formation of the fistulous communication with the intestine or its breaking through. The occasional bouts of fever and pain in the right upper quadrant following this initial attack were due either to cholelithiasis or to cholangitis. The absence of jaundice favors the former possibility. The roentgen signs of intestinal obstruction and the presence of air in the biliary passage should have suggested the diagnosis preoperatively.

In all cases of intestinal obstruction, attention should be directed to the possibility of ileus secondary to gallstones, and evidence of air in the biliary passage is an important observation. The elevation of temperature, pulse rate and leukocyte count, persisting despite Miller-Abbott intubation, suggests that circulatory changes were imminent and that operation was indicated. The size of the stone in this case would have militated against passage through the ileocecal valve, and obstruction in this area would have been complete. Miller-Abbott intubation must be cautiously watched and checked. If obstruction is definite and response to conservative treatment is not evident, surgical intervention without further delay is obligatory. Despite the one bout of fever, chills and jaundice with altered hepatic function, an attack on the fistulous tract is not contemplated. However, should there be recurrent bouts of cholangitis or evidence of abnormal liver function, this opinion may have to be revised.

SUMMARY

An interesting case of gallstone ileus in a comparatively young man is presented, with observations that should have suggested the diagnosis before operation was performed. At-

tention is drawn to the criteria for diagnosis of this condition.

RÉSUMÉ

Un cas de calculs biliaires localisés dans l'iléus chez un malade relativement jeune est présenté. Les observations préopératoires qui auraient dû suggérer le diagnostic sont discutées. Les critériums de ce diagnostique sont énumerés.

RESUMEN

Se presenta un caso interesante de íleo de la vesícula biliar en un hombre relativamente joven, con los signos que debían haber indicado el diagnóstico antes de realizar la operación. Se llama la atención sobre las bases para el diagnóstico de esta afección.

RIASSUNTO

Presenta un interessante caso di ileo da calcolo biliare in un uomo relativamente giovane. Se un esame clinico piu' accurato fosse stato eseguito, la diagnosi sarebbe scaturita prima dell'operazione. L'A. trae argomento da questo caso per esporre i criteri clinici che facilitano una diagnosi preoperatoria.

ZUSAMMENFASSUNG

Es wird ein interessanter Fall von Darmverschluss durch Gallenstein bei einem verhaeltnismaessig jungen Mann vorgestellt, bei dem gewisse Beobachtungen schon vor der Operation zur Diagnose gefuehrt haben sollten. Es wird auf die Kennzeichen, die zur Diagnose fuehren koennen, aufmerksam gemacht.

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Many people get along with the barest minimum of sleep and yet to all outward appearances are perfectly healthy and even live to advanced age. One prominent example is Thomas Edison, who is now well advanced in years and who was accustomed to get only an hour or two of sleep during his most creative period. The same was true of Napoleon, if we may believe his biographers.

The important thing to remember is that these men did not worry about their insomnia. They took it for granted and did not let it interfere with more important affairs of life. The typical insomniac, however, worries about his trouble incessantly, until it dominates his whole life. It is not so much the insomnia that makes him sick, as it is what he thinks about his insomnia.

. . . Sleep, like most of the subconscious parts of bodily activity, is badly deranged as soon as the conscious mind begins to concern itself with such affairs. The heart-beat is entirely beyond our voluntary control. It goes along very well without our consciousness. When a fellow begins feeling and counting his own pulse, then trouble starts.

An applicable story is the one of the old man with the long beard. Somebody asked him whether he slept with the beard outside or inside the bedclothes. He did not know. It had never occurred to him, but he said he would find out that night. So he tried it inside and that did not seem right, and he tried it outside and that did not seem right. He died of exhaustion, so they say, from rearranging his beard.

—Logan Clendening

Pentothal Sodium in Ophthalmic Surgery

A Ten-Year Review of Its Use at the Pittsburgh Eye and Ear Hospital

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INTRAVENOUS pentothal sodium (thiopental sodium) has become well established as one of the most useful of general anesthetics. It has been more widely used each year for the past fifteen years, and is still increasing in popularity. First used in ophthalmic surgery at the Eye and Ear hospital in 1938, it was immediately recognized as an ideal anesthetic for this purpose and was adopted for general use from that time on. The present study was made to evaluate its use over a ten-year period.

General Considerations.—Long and Ochsner[1] reviewed the literature on pentothal sodium in detail in 1942. I shall refer only to some of the pertinent points and to additional knowledge gained since that time.

Pentothal is one of the short-acting barbiturates. An important chemical component is sulfur, a fact that must be considered in contemplating an operation with pentothal anesthesia on a person taking sulfonamides. Lundy[2] has noted general malaise and jaundice when the two drugs are used at the same time. He therefore recommends that sulfonamides be discontinued for twenty-four hours prior to the administration of pentothal.

Pentothal is apparently rapidly detoxified by all of the tissues of the body. Animal experiments[3] have demonstrated that the liver and the kidneys are not important in its destruction or elimination. Clinical experience with pentothal in patients with extensive hepatic or renal damage seems to confirm these experiments, because few untoward effects have resulted. This is in sharp contrast to pentobarbital and amytal, which are unchanged in the body and are excreted from the kidney for seventy-two hours. Veal and Reynolds,[4] however, have demonstrated a cumulative effect of pentothal in experimental animals after repeated doses. One must consider this effect when using the drug for long surgical procedures. We have observed a longer recovery period in cases in which pentothal was used for a long time. This would confirm the existence of a cumulative effect.

Pentothal causes a distinct depression of respiration, evidenced by shallowness of breathing without change in rate. Oxygen must be administered throughout anesthesia to prevent anoxemia and its complications. We have frequently administered coramine along with pentothal to combat respiratory depression. Adriani and Rovenstine[5] have demonstrated bronchospasm due to pentothal, preventable by preliminary administration of atropine. For this reason atropine sulfate is important in preoperative medication. In the early days, laryngospasm was a frequent clinical observation. Thomas[6] has expressed the opinion that the use of a tongue suture instead of an oropharyngeal airway results in marked reduction of the incidence of laryngospasm. Hale[7] recommended the treatment of laryngospasm by the Trendelenburg position, aspiration of the larynx, additional atropine given intravenously and deepening of the pentothal anesthesia. We have used curare successfully in its treatment.

The effects of pentothal on the circulation are mild. Staati[8] has noticed a reduction of blood pressure, but this effect has not been considered significant by most observers. In experimental work with dogs, Reynolds[9] noted cardiac depression on prolonged administration of pentothal. However, this effect has not been found important in clinical studies. Hunter[10] has recommended the use of coramine for the pallor, tachycardia and poor radial pulse that may occasionally occur during the postanesthetic period. Thomas and McCaslin[11] have recommended the routine use of coramine to dilate the coronary vessels in all patients over 50 years of age; in their opinion it insures adequate cardiac circulation. Phlebitis[2] and thrombosis[12] of the veins of the arm in which the pentothal is administered have

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occurred, but are uncommon when a 2.5 per cent solution is used.

Death from overdosage of pentothal is apparently the result of respiratory paralysis. The most important recommended antidotes to this anesthetic are picrotoxin, metrazol, oxygen and coramine.[13] The attempt is directed primarily toward stimulating respiration, and it must be made certain that the airway is open. Recently the administration of sodium succinate intravenously has been recommended, both as an antidote[14] and to shorten the duration of anesthesia.[15] Although the experimental work of others[16] has failed to confirm these effects, some variations of technic were used. Further investigations with succinate are warranted before it is discarded.

Young children do not tolerate pentothal as well as adults. A greater dose per kilogram of body weight is necessary, probably because of the higher metabolic rate, which reduces the margin of safety and complicates the problem of obtaining satisfactory relaxation. The smaller airway in children favors anoxia. Often the small veins and poor cooperation add to the problem. Most writers do not recommend pentothal for patients under 10 years of age.

Pentothal has been reported by Bodman and Farr[17] as producing convulsions. This is extremely rare, and no other report of this type has been found in the literature.

The preparation is contraindicated for operations on the neck because of its effects on the carotid sinus, which accentuate the respiratory depression.

Ophthalmologic Considerations.—Pentothal was recognized as a valuable anesthetic for ophthalmic surgery at an early date. All authors reporting have been enthusiastic,[18] with the single exception of Falls.[19] The incidence of complications was much higher in his report than in any other. It is difficult to explain this difference in his series, because his general procedure was the same as that of most authors.

The characteristics of pentothal anesthesia are particularly suited for ocular surgery. Most operations on the eye are of short duration, so that one usually does not have to consider the cumulative effect. The only harmful effect of prolonged pentothal anesthesia that I have noticed is the slow recovery period. At times this delay may overburden the nursing staff, because a nurse's attendance is required until the patient reacts. Most patients with ocular diseases are elderly, and it is this age group which tolerates pentothal best. In the elderly and asthenic patient, less of the drug is required for adequate anesthesia. Many patients requiring operations for cataract or glaucoma have hypertension, diabetes, or advanced arteriosclerosis. Froschauer and Schrimpf[18e] have noted little difficulty with pentothal in any of these complicating conditions, and my experience has been similar. Cardiac irregularities have apparently been unaffected by pentothal.[20] The absence of excitement in the second stage of anesthesia is a particular advantage in the presence of hypertension and nephritis. In these conditions the shock to the nervous system is no doubt less than if a local anesthetic were used.

Nausea and vomiting following pentothal anesthesia are not common and may be caused by the preoperative medication rather than by the barbiturate itself. These do occur, however, and are more frequent than after local anesthesia.

The respirations are quiet, causing no movement of the head during the operation. Finally, the anesthetist is located away from the operative field and in no way interferes with any operative procedure taking place about the eye.

A lowering of intraocular pressure is desirable in all operations for cataract or glaucoma. Panzardi[21] has observed a lowering of the intraocular tension averaging 7.5 mm. of mercury (Schiotz) in patients under pentothal. This eliminates the necessity for a retrobulbar injection, which may be accompanied by complications.

AUXILIARY MEDICATION

Although pentothal may be used alone for anesthesia, various drugs may be employed that improve it as an anesthetic agent and tend to increase its safety:

Atropine.—Preoperative administration of atropine is essential to a safe and quiet pentothal anesthesia. It not only prevents bron-

chospasm and laryngospasm but reduces secretion along the respiratory passages that might obstruct the airway. I use atropine sulfate (gr. 1/100) half an hour before operation.

Opiate.—An opiate given prior to the administration of pentothal is helpful in sedation and in relief of mental anxiety. In this way it contributes indirectly to a smooth anesthesia. It is not, however, as important as the atropine. I use morphine sulfate (gr. 1/6) half an hour before the operation. If for some reason morphine is contraindicated, demerol (100 mg.) may be substituted.

Local Anesthesia and Akinesia.—The administration of topical anesthesia is an essential aid to pentothal. It prevents the necessity of anesthesia so deep as to be unsafe. Subconjunctival and retrobulbar anesthesia along with lid akinesia is optional. Froschauer and Schrimpf[18e] feel that these forms of anesthesia decrease the amount of pentothal required. They found only 3 to 10 gr. necessary. I average 15 gr. without the additional local anesthesia and do not feel that this difference in amount is significant. I therefore recommend only topical anesthesia.

Curare and Curare-Like Compounds.—The most recent adjunct to pentothal anesthesia is the curare group of compounds. The chief purposes of curare are to aid in muscular relaxation and to provide the possibility of adequate anesthesia with a reduced dose of pentothal. Muscular relaxation is more important to the abdominal than to the ophthalmic surgeon. However, the reduced dose of pentothal required is important to all surgeons. It results in a more rapid recovery from anesthesia, which is of particular value in operations of long duration.

The reader is referred to the review of the literature on curare by Robbins and Lundy[22] for an excellent summary of its properties. Curare acts by increasing the threshold of the muscles to acetylcholine. For this reason it is contraindicated in cases of myasthenia gravis. The action appears first in the extraocular muscles and the orbicularis oculi. The muscles of the face, neck, throat, trunk and extremities are affected thereafter in succession. The diaphragm is last to be paralyzed. Kirby[23] has used curare in combination with local anesthesia to produce immobility of the eyeball. I have confirmed his success with this procedure, but a report of that procedure is not within the scope of this presentation.

Pick and Richard[24] have noted a synergistic action of curare and barbiturates in experimental animals. Their work may serve as a basis for assuming that the dose of pentothal is reduced when curare is used. My experience in a limited number of cases has not confirmed this assumption, as will be noted later.

Curare is excreted by the kidneys and therefore is contraindicated in cases of impaired renal function. It has been very valuable in facilitating pentothal anesthesia in heavy smokers and alocholic patients, because patients of this type frequently require an excessive amount of pentothal if curare is not used.

Although several forms of curare are available for clinical use, our experience has been primarily with D-tubocurarine chloride. A dose of 20 to 60 units of curare may be administered intravenously with pentothal, but care must be taken not to inject more than 1 cc. per minute. Curare cannot be mixed with pentothal, as a precipitate is formed. It is a simple procedure to administer the two drugs through the same needle when suitable apparatus is available. The entire system may be cleared with saline solution before the other drug is used. Baird[25] has recently administered a buffered mixture of pentothal and curare with success. However, he has not yet had a long enough series of anesthesias with this mixture for final conclusions to be drawn.

Antidotes for curare must be available whenever it is used. Neostigmine (prostigmine) and eserine are most important, although oxygen and facilities for artificial respiration must also be available.

MODE OF ADMINISTRATION

A capable anesthetist with a thorough knowledge of the characteristics of pentothal and curare, if the latter is used, is essential for safe anesthesia. The intermittent method of administration has been accepted as the best by most anesthetists. By this method additional pentothal is administered only as needed.

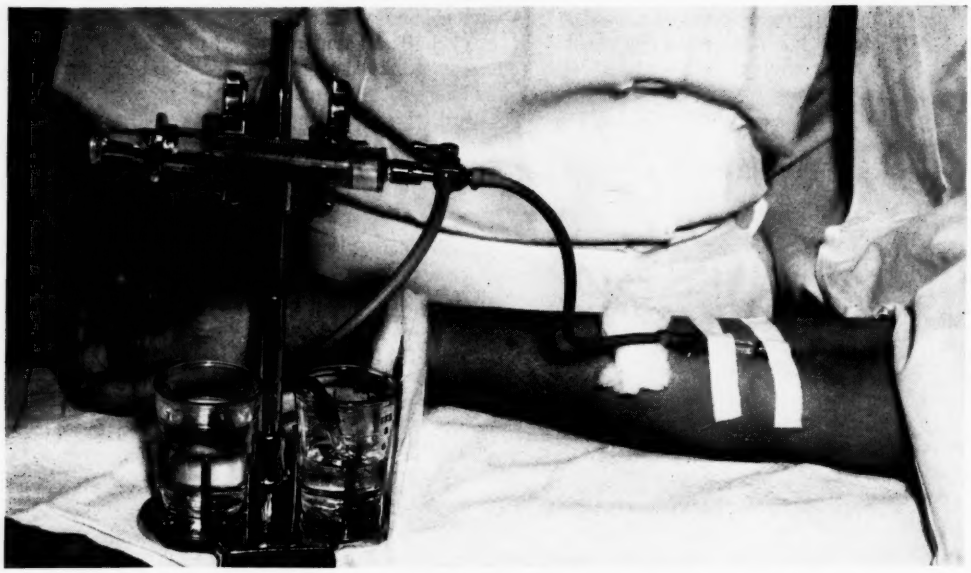

Fig. 1.—Apparatus for administration of pentothal. One of the 1-ounce glasses contains 2.5 per cent pentothal solution; the other contains physiologic solution of sodium chloride.

Administration of the anesthetic is much easier when an apparatus of simple design is used. Dr. George J. Thomas of the anesthesia department has designed the apparatus shown in use in Figure 1. One medicine glass is filled with 2.5 per cent solution of pentothal, and the other is filled with physiologic solution of sodium chloride. After each pentothal injection the system is cleared with the saline solution. By means of the three-way stopcock the syringe may first be filled with pentothal from one medicine glass. After injection of the pentothal, the glass adapter may be transferred to the other glass (containing saline solution), and the latter may be injected intravenously, thus clearing the entire system of pentothal. The syringe may then be filled with curare, or curare may be injected through the rubber tubing connected with the needle. The essential divisions of this setup are all parts of routine hospital equipment and are shown in Figure 2. Added to the equipment in the illustration are the drugs and their antidotes, which should be available for immediate use at all times.

The details of anesthetic routine have been described elsewhere,[11] so I shall mention only the essential points. One-half hour before the anesthetic is given, morphine sulfate (gr. 1/6) and atropine sulfate (gr. 1/100) are administered hypodermically. Topical ocular anesthetics are given immediately before the operation, in the form of drops of 4 per cent cocaine hydrochloride or 0.5 per cent pontocaine hydrochloride. An oropharyngeal airway is frequently used, but a tongue suture is considered better, particularly in edentulous patients. Oxygen is administered through a mouth hook and is continued after the patient leaves the operating room until he has fully reacted.

I have found that, in localities where pentothal is only occasionally used in ophthalmic surgery, a simple setup and routine, such as those utilized here, have never been tried. Some anesthetists are unfamiliar with the drug and therefore get into trouble. I feel that more ophthalmologists would prefer pentothal if local conditions were satisfactory.

TEN-YEAR SURVEY

During the ten-year period from 1939 to

1949, pentothal sodium was administered for 4,083 ophthalmic operations. Of these, 1,733 were included in a previous report by Thomas and McCaslin.[11] The total group constitutes 46.8 per cent of the eye operations performed during the same period. Table 1 lists the number of operations of each type performed with pentothal, the average amount of pentothal required, and the average duration of the operation. The duration varied from five to one hundred minutes, and the amount of pentothal required varied from 3 to 45 grains. The anesthesia has been found equally satisfactory in all types of ophthalmic surgery. The average amount of pentothal required varied little with the type of operation but was almost directly proportional to the time required for the procedure. The variation in dosage required can no doubt be correlated with the age of the patient. In my experience, there is no procedure in ocular surgery for which pentothal is contraindicated.

There were relatively few complications in the entire series. Nausea and vomiting occurred in about 4 per cent of the patients. It was difficult to determine the actual number in which the recovery period was prolonged. The patients usually were awake in fifteen to thirty minutes, but lapsed back into a physiologic sleep lasting several hours. They could be awakened at any time during this period. When awake, they felt refreshed and relaxed. I feel that this is a material aid to normal recovery and healing of the surgical trauma. When a prolonged reaction time did result, it invariably followed a long operation in which considerable pentothal was used. This reaction is, no doubt, the result of the cumulative effect, but no harm has resulted in any of our cases.

An oropharyngeal airway was used in 72 per cent of the cases and a tongue suture in 4 per cent. In the remaining 24 per cent nothing was applied to maintain a free airway. The only disadvantage of the tongue suture is that the patient complains of a sore tongue for a day or so. In no case has this condition been

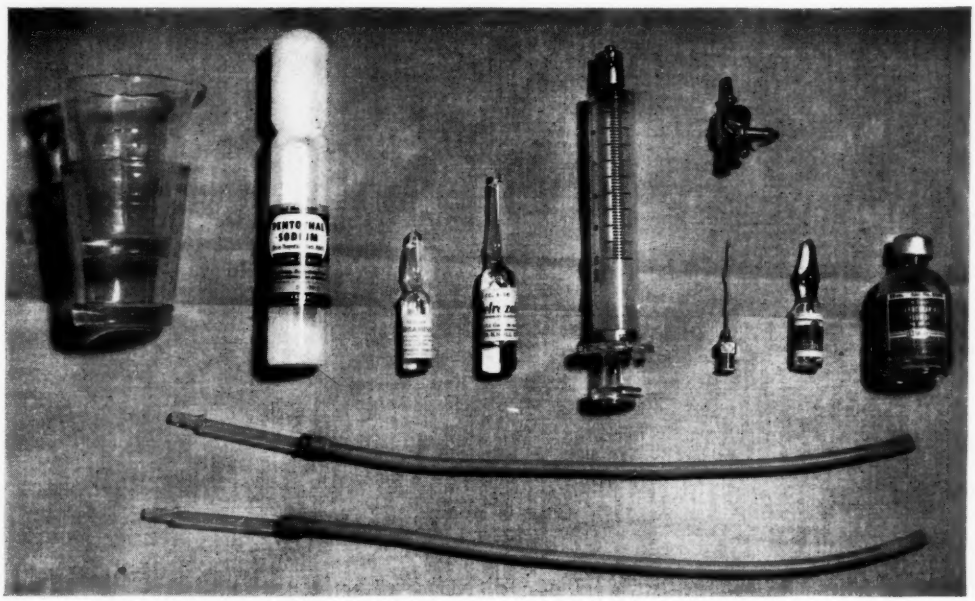

Fig. 2.—Essential materials for administration of pentothal and curare: Two 1-ounce medicine glasses; ampule of pentothal sodium (15 gr.); antidotes for pentothal sodium (coramine and metrazol) in ampules; a 10 cc. syringe with three-way stopcock and intravenous needle; curare antidote (prostigmine); curare, and two rubber tubes with glass adapters. The apparatus for holding the syringe is omitted from the photograph.

TABLE 1.—*Pentothal Sodium in Ophthalmic Surgery*

Procedure	Number	Average dose (gr.)	Average time (min.)
1. Operation for cataract (all types)	2,306	14	23.5
2. Operation for glaucoma (all types)	324	13	25
3. Operation on lacrimal apparatus	11	15.5	34
4. Operation for detached retina	163	20	39.5
5. Operation for strabismus	319	15.5	32
6. Enucleation and evisceration	425	15	33
7. Exenteration	7	22	58
8. Iridectomy and iridotomy	254	8	15
9. Operation on lid	86	19	39
10. Operation on cornea and conjunctiva	104	14	23
11. Magnet extractions	64	19.5	28
12. Miscellaneous	20	—	—
Total	4,083		

TABLE 2.—*Pentothal Sodium in Ophthalmic Surgery*

Case	Age of patient	Sex of patient	Amount of pentothal (gr.)	Interval between anesthesia and death	Operation	Cause of death
1	74	F	10	40 hours	Enucleation	Coronary occlusion
2	56	F	10	72 hours	Paracentesis	Coronary occlusion
3	56	F	8	0	Iridectomy	Pentothal
4	67	F	15	7 days	Iridectomy; tooth extraction	Coronary occlusion
5	86	F	7½	9 days	Cataract	Pneumonia
6	72	F	10	48 hours	Cataract	Coronary occlusion
7	73	M	11	13 hours	Cataract	Coronary occlusion
8	80	M	15½	22 days	Cataract	Coronary occlusion
9	80	F	12	11 days	Cataract	Coronary occlusion (autopsy)
10	90	F	7½ 3 (5 days later)	20 hours	Cataract Prolapse of iris	Coronary occlusion; pentothal? (autopsy)
11	73	M	12	6 days	Cataract	Cerebral hemorrhage
12	73	M	12	27 days	Cataract	Bronchopneumonia (autopsy)
13	75	F	8	18 days	Cataract	Bilateral lobar; pneumonia
14	70	M	6	51 days	Glaucoma	Lobar pneumonia; lung abscess (autopsy)

severe. Coramine (to stimulate respiration) was given during the operation or immediately after it in 16 per cent of the cases. No harmful effect has been observed from the coramine.

In this ten-year study curare was given to treat laryngospasm or along with the pentothal only 7 times. We do have records of 44 cataract operations performed with pentothal and curare this year. In these cases the average amount of pentothal used was 15.5 gr., and the average duration of the operation was twenty-six minutes. In comparing these figures with those for the ten-year period in which no curare was used, it is noted that approximately the same amount of pentothal was required. This fact tends to disprove the assumption that curare enables one to use less pentothal. The true answer cannot be brought out until more experience with the combined use of these drugs has been accumulated.

Fourteen patients who received pentothal in this group died during the postoperative

period (Table 2), but only 1 death can be definitely attributed to pentothal (Case 3). In Case 10 the autopsy observations indicative of coronary disease were not sufficient to determine whether or not pentothal was a factor. The autopsy also revealed nephritis, hypertension, chronic hepatitis and cholecystitis were contributory causes of death. At the patient's advanced age even a minor condition, added to the others, might have caused death. I do not feel warranted in placing the blame on pentothal.

In Cases 1, 2 and 7, the time that elapsed after the anesthesia may suggest pentothal as a cause of death, but in each of these cases complete recovery from the anesthesia had occurred. The history and progress of symptoms, along with physical signs and electrocardiograms in 1 instance, left no doubt as to the diagnosis of coronary occlusion.

The high incidence of coronary occlusion might suggest pentothal as a cause of thrombosis of the coronary arteries. I do not feel that the incidence of coronary accidents is any higher in this group than in a corresponding series in which local anesthesia was employed. In my opinion the incidence is lower. It would be interesting to compare this group with a group of such patients in whose cases local anesthesia was used.

SUMMARY

1. A brief review of the literature on pentothal sodium anesthesia is presented, with particular reference to its use in ophthalmic surgery.

2. An analysis of the use of this drug as an anesthetic agent in ophthalmic surgery in 4,083 cases over a ten-year period is presented.

3. The author concludes that pentothal sodium is an ideal and safe anesthetic for ophthalmic operative procedures.

RÉSUMÉ

1. Une revue très brève de la litérature concernant l'emploi de penthotal sodium comme anesthésique est présentée et en particulier ses rapports avec la chirurgie ophthalmique.

2. L'analyse de l'emploi de ce produit comme agent anesthésique dans la chirurgie ophthalmique durant une période de dix ans, dans 4,083 cas est présentée.

3. L'auteur conclut que la penthotal sodium est un anesthésique sûr et idéal pour les opérations ophthalmiques.

RESUMEN

1. Se revisa brevemente la literatura sobre pentotal sódico haciendo mención especial de su uso en cirugía oftalmológica.

2. Se presenta un análisis del uso de esta droga como agente anestésico en cirugía oftalmológica, en 4083 casos, durante un período de 10 años.

3. Se concluye que el pentotal sódico es un anestésico ideal e innocuo en las intervenciones oftalmológicas.

ZUSAMMENFASSUNG

1. Es wird eine kurze Uebersicht der Literatur ueber die Anaesthesie mit Pentothalnatrium gegeben und auf ihre Anwendung in der Augenchirurgie besonders eingegangen.

2. Die Anwendung des Mittels als Anaesthetikum in der Augenchirurgie wird an einer Reihe von 4083 Faellen, die in einer Periode von zehn Jahren beobachtet wurden, eroertert.

3. Die Schlussfolgerung ist, dass Pentothalnatrium ein ideales und sicheres Anaesthetikum fuer ophthalmologische Operationen darstellt.

RIASSUNTO

1. Breve rassegna storica dell'anestesia con pentotal sodico, con speciale riguardo al suo impiego nella chirurgia oculare.

2. Discussione sopra i risultati di quest'anestesia in 4083 casi operati in un periodo di 10 anni.

3. L'A. conclude affermando che il pentotal sodico offre un'anestesia ideale nella chirurgia dell'occhio.

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Editorial

Joint Enterprise: II. The Illustrations

It takes approximately three and one-half pages of double-spaced typescript to fill one text page of the Journal of the International College of Surgeons.

Does this seem an odd sentence to introduce a communication about illustrations? It may, to the uninitiated. The fact remains that it has important bearing upon the subject. Every contributor should bear in mind that any paper of less than fifteen pages of typescript, double spaced, is a "short" paper and that the number of illustrations it will carry is strictly limited.

We realize, as fully as do our authors, how much interest and value is added to an article by fine drawings, photographs and charts. We are aware of the fact that, as someone has aptly said, "one picture can accomplish as much as ten thousand words of text." We sincerely appreciate the generosity of our contributors in this respect and the almost uniformly high quality of the illustrations submitted. But we are faced every month with the problem of laying out brief articles that cannot be made to cover the space required for the accompanying illustrations. What to do?

Well, there are several possibilities. First, we can write to the author and suggest reducing the number of cuts or lengthening the article. Both expedients are time-consuming and result in delayed publication. If the author consents to reduce the number of cuts, he usually wants them returned to him for the purpose. To lengthen the article is, as a rule, unwise; presumably the author has covered his subject in the first place, and the need of expansion is apt to result in "padding." We are doing the author no favor if we suggest it. The inclusion of a great many pictures, however impressive, will compensate neither the author nor the *Journal* for loss of the article's quality.

Second, we can—and frequently do—reduce the number of cuts by combining two or more which have a clear relation to one another. This method is very good as far as it goes. Unfortunately, however, the shape, nature or sequence of the cuts may be such as to make it impossible. For example, we may note that Figure 4 and Figure 6 would combine nicely; but there is Figure 5 to be reckoned with, and Figure 5 is a circular photomicrograph that cannot be combined with either of the others. There is also the dire possibility that, even after all possible combinations have been made, the number of cuts is still disproportionate to the length of the article. The printers cannot help us here; they cannot stretch the article to conform; as they dourly point out to us, they have no rubber type!

Third, we can—as a last resort and only if the article is an extremely short one—lengthen it by having it translated *in toto* into the four foreign languages ordinarily used for summaries alone. This is undesirable for several reasons, the chief one being that the author is not left much choice in the matter of his reprints. He must include the translations in the reprints or leave most of his illustrations adrift in a sea of blank space. The cost of the reprints, which is based on the number of pages included, is of course proportionately increased.

The solution of this problem, accordingly, rests chiefly with the author. While the manuscript is in preparation, the author should estimate the approximate number of *Journal* pages it will require and arrange his illustrations on that basis. A little judicious selection is in order. For example, if he is reporting a series of similar cases, he should select two or three representative roentgenograms, drawings or photomicrographs indicative of the lesion or its treatment, as the case may be; these, with carefully written legends, will often serve as well to point up the article as would a separate picture for each case. Only if the article is a long one—twenty pages or more of double-spaced typescript—should more than half a dozen pictures accompany it.

Preparation of Illustrations.—Illustrations for the *Journal* are of three main types: (*1*) halftones, (*2*) charts, diagrams and line drawings and (*3*) color plates. The great majority, including all roentgenograms and most photomicrographs,* are reproduced as halftones. Charts, diagrams and line drawings are reproduced as zinc etchings, a less expensive process but strictly limited to illustrations without shading. Color plates, which are magnificently effective but extremely high in cost, are used at the author's discretion. Sometimes an author submits a fine color plate without realizing in advance the cost of reproduction. In such a case two estimates are always sent, one for color and one for ordinary halftone (black and white); the astronomic difference usually leads the author to choose the latter, and our engravers have no difficulty in obtaining a halftone cut of excellent quality. There is therefore no reason to withhold a good color print because of the cost of color reproduction.

With this background in mind, the author in preparing his selected illustrations should give special attention to the following points:

1. Submit all illustrations flat and in good condition, either loose or mounted but *never pasted to the pages of the text.* If they are so pasted and cannot be loosened without damage, the manuscript must be cut to ribbons and reassembled before it can be edited. Photographs for halftone reproduction should be glossy prints of the best obtainable quality and should be so packed as to protect them against creasing or bending, the effects of which will show in the reproduced cut. Paper clips should never be used, nor should staples; the former will leave a mark, the latter leave holes.

2. All illustrations should be clearly identified and oriented by the words "Figure—" and "Top" clearly typed on a label pasted on the reverse side. (The typewriter, a pen or even a pencil may dent the surface.) The author's name and address should appear here also. *These directions are extremely important.* If the top of the picture is not indicated and is not perfectly evident from the picture itself, trouble may result.

3. A *list of legends* numbered to correspond (Figure 1, Figure 2, Figure 3, etc.) *should be sent with the manuscript on a separate page or pages.* Legends may be short or long as occasion requires. They should contain all the descriptive matter necessary to understanding of the picture, so that marks on the picture itself may be kept to a minimum. Unless the author is an artist at lettering, the writing or printing of explanatory letters, words and phrases on the picture itself is to be deplored. They often ruin an otherwise excellent effect and must be removed by the engravers, after which the Editorial Staff must rewrite the legend to include them. The author naturally prefers to write his own legends, and if he will bear this in mind from the beginning he will avoid possible annoyance and delay.

If the illustrations and the legends are correctly numbered to correspond, there is no danger of confusion. *It is therefore unnecessary and undesirable to write the legends either on the backs of the pictures or on strips attached to them.* Legends do not go with the pictures to the engraver; therefore, if either of these methods is used, all the legends must be copied in sequence on a separate page in the Editorial Office in order that they may accompany the manuscript to the printer.

If *large photomicrographs* are submitted, the author should indicate whether they may be reduced and, if so, how much and by what method. We never reduce photomicrographs without permission. There are two possible methods of reduction; (*a*) the usual photographic process and (*b*) "cropping," i.e., omitting all but the significant areas. If the latter method is to be used, the author should indicate plainly how far these areas extend. If he is willing to have the magnification reduced, he should add "Reduce if necessary" to the data on the label pasted on the back of each picture.

A little study of *Journal* illustrations, with these facts in mind, would prove permanently valuable to any contributor. Let him note the size of the *Journal* page and the proportion of pictures to text as regards both size and number. Careful perusal of several legends, both short and long, will clarify his own ideas in this respect. The writing of clear, concise legends is an art in itself, and can be

*Photomicrographs may also appear in color.

an enjoyable mental exercise. Though nothing essential should ever be omitted, most legends could be shortened to advantage; it is unnecessary, for example, to repeat whole paragraphs of the text when the laconic reference "See text" is sufficient. Reference to a particular case can be covered neatly by mentioning it in the legend, thus: "Fig. — (Case —)."

Not infrequently an author will object to the *placing* of his illustrations, thus: "I refer to Figure 8 on Page 70, and it has been inserted on Page 75. Please try to avoid this sort of confusion in the future." To this complaint there is only one reply: "Dear Dr. X, we have tried and do try to avoid it. We are as much concerned as you can be with the avoidance of confusion of every kind, and we should like nothing better than to place Figure 8 on Page 70, exactly where you have referred the reader to it. Unfortunately, however, *seven illustrations precede Figure 8, and your article begins on Page 69.*" The implication is obvious. As a matter of fact, the "confusion" resulting from the placing of Figure 8 is negligible if the illustration is properly numbered. Few readers will object to the physical labor of turning a page or two if they are genuinely interested in what the author has to say.

The fewer the illustrations submitted, of course, the more likelihood there is that they can be inserted parallel with the author's reference. Laying out a large journal page by page, however, and correlating text with illustrations even approximately, is a task more difficult that anyone can realize who has not actually tried it.

For this reason and a number of others, we hope that the foregoing brief résumé of the problems involved will clarify matters for our contributors as well as for the Editorial Staff. The cost of illustrating an article effectively is not inconsiderable, and it is in the author's own interest to economize in time as well as expense. The author who takes comparatively slight trouble to observe all recommended precautions will emerge with a double reward. He will know that he has protected his manuscript from the possible mistakes of others, and he will have the satisfaction, by no means a slight one, that attends a good job competently done. Last but not least from the Editor's point of view, he will carry the Editor's blessing wherever he goes!

M.T.

The House of Delegates

of the

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New Horizons

By the Editor

The Argentine Assembly
Southern Hospitality, Unlimited

The Seventh Assembly of the International College of Surgeons, held in Buenos Aires with the enthusiastic aid and cooperation of the Argentine Government and marked by a hospitality so lavishly gracious that only the word "magnificent" can do it justice, was an occasion long to be remembered and one that sets up a new milestone on the highway to scientific fulfillment and world-wide fraternal relations. The International College, which was founded as an exponent of these two ideals and maintains a steadfast pursuit of the goal, has never encountered greater understanding, sympathy and encouragement. Our activities were facilitated in advance by a handsome grant from the Government for that express purpose. The President, General Juan Peron, and his justly celebrated wife, Señora Eva Peron, gave unstintedly of their time and personal attention, welcoming without reservation the liberal exchange of opinions and displaying an open-mindness on controversial subjects that augurs well for the future of Argentina. A spirit of unreserved international good will was manifest throughout, and despite the splendor, pageantry and picturesqueness of the background and the essential formality of the occasion, no informal gathering could have been more fully pervaded by warmth, geniality and relaxation.

Some 300 surgeons attended from the United States. Most of them made the journey on a boat of the Moore-McCormick line, specially chartered from Uruguay; for these the voyage was highlighted by a scientific symposium en route, at which many stimulating papers were presented and discussed. Among the leaders of this interesting odyssey were Dr. Henry W. Meyerding, Dr. Custis Lee Hall, Dr. Harry E. Bacon, Dr. R. J. Behan, Dr. Moses Behrend and Dr. Leigh F. Watson. Others traveled by air. All, on their arrival, were greeted with the cordiality of old acquaintance, and the diversified program took place in a satisfying crescendo of interest, amity and enjoyment.

It is an abiding satisfaction to report that in this Assembly, as in every new coming together of the College, the steady growth of the organization in membership throughout the world was more than paralleled by the increasing scientific value of the presentations offered. No surgeon whose heart is in his work can remain unmoved by such an experience; one's vision and courage are strengthened, one's intellectual range broadened and one's understanding of world problems invested with new depth.

The Assembly program left no surgical field unexplored. Not only clinical but experimental surgery was emphasized. Special presentations in gynecology and obstetrics, neurosurgery, orthopedics, plastic surgery, roentgenology, war injuries, surgery of the endocrine glands, chemotherapy and the use of antibiotics were highlighted, in addition to expositions of surgical technic for all parts of the human body. Some 4,000 persons packed the auditorium—visitors from all over the world, specialists and general surgeons from countries once far removed but now brought close together by modern communication, transportation and the shared ideal of world-wide fraternity. It was a participating audience; each successive paper was greeted with generous acclaim, and the swift exchange of ideas became almost a visible and palpable entity among us.

The Argentine Chapter, though comparatively young, has an impressive record of rapid growth and general solidity. A permanent Commission has been established for the furtherance of its aims, and a fine building has been set aside by the Government as its permanent headquarters. All members of the Chapter seem imbued with the spirit of scientific progress and with an energetic desire to increase the effectiveness of their work.

The hospitality of our hosts reached its climax in a special luncheon given in the gardens of the Presidential Palace, in a pavilion especially prepared for the occasion and presided over by General Peron and his charming Señora. There was a resplendent display of flags, not only of Argentina but of all the nations represented. About 1,500 persons were present. Between courses we were entertained by brilliantly staged features demonstrating age-old traditions and the colorful folklore of Argentina. Music, dancing and native arts and crafts were brought forward in an unforgettable manner, leaving us with a totally new understanding of our neighbors to the south and a permanent and intimate sense of personal acquaintance.

Guests at the Presidential table included Dr. Max Thorek, Founder, and Dr. Herbert Acuff, President, of the International College of Surgeons; Dr. Jorge Taiana, Director of the Evita Peron Social Aid Foundation; Dr. Ricardo Finocchietto, Minister of Education and Public Health; Drs. Armando Mendez San Martin and Ramon Carrillo; the Administrative Secretary to the President, Major Carlos V. Aloe, and the Assistant Secretary of Information, Señor Raul A. Apold.

After luncheon General Peron spoke briefly, an interpreter translating his remarks into English. "In our country," he said, "there is a tradition of friendship. For Argentinians this same friendship, which can unite two individuals or two peoples, is a friendship that has come down to us through the ages and which we still find throughout our Republic. It is our hope that the delegates who have been with us during the past few days will carry back with them the assurance that we are their friends. The surgeon is always face to face with suffering humanity, always working for the benefit of mankind. This is our own ideal. Because of this, we know that surgeons are men of good will, and we feel that those who devote their lives to the benefit of humanity should be united and keep in close touch with one another.

"We are working for the same goal, and we shall always be united as friends and servants one of the other. We are delighted to have had these visitors with us and hope that they will come again. They will always be welcomed here with open hearts and open arms."

The President followed this greeting with some highly interesting comments upon the status and progress of medical and surgical science in Argentina. He spoke of unfortunate conditions which the present Government, having a high realization of the vital importance of health to the future of the nation, is striving to correct. "We have been able in the course of four years," he said, "to eradicate malaria from one of the largest malarial districts on the American Continent. . . . We have added a policy of public health that has resulted in the founding of hospitals and public health services all over the country. There is still a scarcity of doctors. . . . The health of the children is what interests us most, because we are working steadfastly toward the future. . . . From the scientific point of view, surgical art, science and technic are very well developed here; but surgery is still exceedingly costly, and we have not yet any organization capable of meeting all surgical needs. We are striving to make expert surgical aid available to all of our people, rich and poor alike. During the past four years we have been able to add 30,000 to the number of hospital beds available throughout the Republic. In this connection the Social Aid Fund, over which Señora Peron presides, has furnished and will furnish, by the end of the year 1952, another 15,000 hospital beds. These 45,000 beds bring us within sight of what we are aiming at. Later . . . we hope and expect to be able to furnish specialized surgical services capable of attending to the needs of 17,000,000 Argentinians."

Señora Peron also spoke briefly, extending to the Assembly the love and welcome of the Argentine people: "I wish to extend a cordial and affectionate welcome to the eminent personages in the world of surgery who are gathered together in this Congress. . . . We cannot doubt that the present gathering will go down in history as an example among meetings of this nature for its unanimity of purpose and the nobility of its ambitions. Such desires as these confer upon men their highest dignity and justify the highest hopes of collaboration and cooperation for the health and welfare of the nations."

The deep appreciation of the United States

Chapter was expressed in short addresses by Dr. Thorek and Dr. Acuff. Special acknowledgement was made to Dr. Carillo, the Minister of Public Health and Education, and Prof. Dr. Taiana, Director of the Social Aid Foundation, for their generous efforts in behalf of the Assembly. Dr. Taiana then responded for Argentina, also expressing gratitude for the excellent cooperation of University faculties and hospital staffs in planning for the occassion.

During the course of the Assembly, the Embassies of Peru, Spain, Finland, Bolivia, Brazil and the United States bade us welcome by formal receptions given in honor of the College. These occasions, both distinguished and distinctive, will never be forgotten by those who attended them. The acknowledgement they imply is no small honor to the International College of Surgeons. It is clear that our aims and purposes, as well as our achievements thus far, have won the recognition we hope and believe they deserve. Perhaps this should be no surprise; but in every great enterprise the spirit of humility, a natural outgrowth of the immensity of the task, pervades most deeply those who work hardest for its completion, and such rich rewards are always unexpected. They are none the less delightful for all that, and none the less appreciated and treasured in memory.

The test of biological variations and mutations is whether they lead to increasing fitness, and the test of all social and moral mutations and revolutions, such as those of today, is whether they lead to increasing perfection and progress. The great principle of the survival of the fit has guided evolution from amœba to man, from tropisms and reflexes to intelligence and consciousness, from solitary individuals to social organizations, from instincts to ethics; and this great principle will not be abrogated today or tomorrow. It is the "power, not ourselves, that makes for righteousness." Man can consciously hasten or hinder this process, but he cannot permanently destroy it. He can refuse to take part in it and can choose to be eliminated, but the past course of evolution for millions of years indicates that somewhere and somehow this process will go on.

The evolutionist is an incorrigible optimist; he reviews a billion years of evolution in the past and looks forward to perhaps another billion years of evolution in the future. He knows that evolution has not always been progressive: that there have been many eddies and back currents, and that the main current has sometimes meandered in many directions; and yet he knows that, on the whole, it has moved forward. Through all the ages evolution has been leading toward the wider intellectual horizons, the broader social outlooks, the more invigorating moral atmosphere of the great sea of truth.—Edwin Grant Conklin

General News Notes

Incunabula Catalogue Published: A complete catalogue of incunabula and manuscripts in the Army Medical Library has recently appeared. Three classes of works are included: (*1*) the incunabula; (*2*) early Western manuscripts in Latin, German, Italian and English, and (*3*) Oriental manuscripts in Arabic, Persian, Turkish, Singhalese and Hebrew. The sections on incunabula and early Western manuscripts were compiled by Dr. Dorothy M. Schullian and the section on Oriental manuscripts by Francis E. Sommer. The Catalogue is dedicated to the memory of John Shaw Billings. It is expected to fill a definite need.

Maxillofacial Surgery: The Annual Meeting of the American Society of Maxillofacial Surgeons was held from September 24 to 27 inclusive, in New York. Sessions were held at the Presbyterian Medical Center, the Memorial Hospital and the Manhattan Eye, Ear and Throat Hospital. A highly stimulating program was presented.

Ambulatory Fracture Association: The preliminary program of the Eleventh Annual Meeting of the Ambulatory Fracture Association, a notice of which appeared in our September issue, carries a cordial invitation from Dr. Custis Lee Hall, President, to all surgeons interested in fractures and traumatic surgery. The meeting will convene at the Gibson Hotel in Cincinnati, Ohio, October 16 to 19 inclusive.

Military Surgeons' Convention: Announcement is made of the 1950 Convention of the Association of Military Surgeons of the United States, to be held at the Statler Hotel in New York City, November 9 through November 11. Among the speakers scheduled to appear are Louis H. Bauer, M.D., F.A.C.P., Secretary of the World Medical Association; Howard A. Rusk, M.D., whose subjects will be "Total Rehabilitation in Total Mobilization"; William F. MacFee, M.D., Surgical Director, St. Luke's Hospital, N. Y., "The Surgery of World War III."

Morris Weintrob, M.D., F.I.C.S., of Brooklyn, New York [Commander, MC, USNR] is chairman of the Scientific Exhibits Committee.

Tenth Dermatology Congress: During the summer of 1952 the Tenth International Congress of Dermatology will convene in London under the presidency of Sir Archibald Gray. It is requested that the secretaries of the various dermatologic societies of the world communicate with Dr. Gordon B. Mitchell-Heggs, Institute of Dermatology, St. John's Hospital, Lisle Street, Leicester Square, London, W.C. 2, in order to make certain that their names are included in the program.

Health Association Meeting: The American Public Health Association will hold its seventy-eighth annual meeting in conjunction with 32 relative public health organizations at St. Louis, Missouri, from October 30 to November 3. The program includes practically every phase of hygiene and public health. Dr. Reginald M. Atwater is executive secretary of the association, whose address is 1790 Broadway, New York 19, New York.

Ophthalmologic Congress: The Fourth Pan-American Congress of Ophthalmology is slated to be held in Mexico City from January 6 to 12, 1952. An impressive program is in the formative stage, and those interested should communicate with the Secretary of the congress.

Federation of Physical Medicine: In London the International Federation of Physical Medicine convened recently for the purpose of promoting on an international basis the study and practice of physical medicine and for holding conferences on the same subject. The temporary chairman is Dr. Frank Krusen (Mayo Clinic, U.S.A.). Headquarters are in London. Those interested should address the British Association of Physical Medicine, 45 Lincoln's Inn Fields, London, W.C. 2. The first congress is to be called in London in July 1952.

Japanese Journal Resumes Publication: The Japanese Journal of Biochemistry, founded in 1922 and discontinued in 1944, has taken a new lease on life. It is the official organ of the Japanese Biochemical Society. Many brilliant publications and important papers of Japanese biochemists have appeared in this journal during the past. With its republication we may hope to see the fruits of Japanese scientific progress given world recognition. The Journal will appear quarterly from the Institute of Biochemistry, Tokyo University.

Travelling Fellowship: A travelling fellowship in Thoracic Surgery has been created by the American Association for Thoracic Surgery. The Society of Thoracic Surgeons of Great Britain and Ireland have been asked to nominate the first holder of the fellowship.

Chapter News

United States Chapter

Dr. Arnold S. Jackson, Secretary of the United States Chapter, presents the usual good report of progress.

Recent Honors: Dr. Rudolph Nissen of New York has declined an offer to take over the chair of surgery at the University of Hamburg, Germany.

Dr. Lyon H. Appleby, F.A.C.S., F.R.C.S. (England and Canada), who has been vice-president of the International College of Surgeons and was recently reappointed, has been made an Honorary Fellow of the American Proctological Society.

The Alumni Association of the New York University College of Medicine, a unit of the New York University-Bellevue Medical Center, has elected Dr. Sydney D. Weston, F.I.C.S., (Hon.) as its president.

Wisconsin Section: The Wisconsin Section of the United States Chapter, International College of Surgeons, met at the Hotel Schroeder in Milwaukee on Sunday, October 1. After the business meeting in the late afternoon the members reassembled for dinner, which was followed by the scientific program. Two outstanding papers were presented; "Surgery of the Extrahepatic Biliary System" by Dr. Maurice G. Rice of Stevens Point and "Endometriosis" by Dr. Eugene L. Dallwig of Milwaukee. A report of the Buenos Aires meeting of the International College of Surgeons was given by Dr. William C. Gnagi of Monroe. Dr. Arnold S. Jackson outlined plans and attractions for the forthcoming Assembly in Cleveland.

Southern California Section: The Second Annual Clinic Day program of the Southern California Section was presented at the Auditorium of the Los Angeles County Medical Association, Los Angeles, on September 13, with Dr. Donald C. Collins of Hollywood presiding. It was an all-day affair, including morning, afternoon and evening sessions. The guest speaker of the evening was Dr. Robertson Ward of San Francisco. Dr. Ward spoke on "Malignant Disease of the Thyroid Gland."

Alabama Surgical Section: The Alabama Surgical Section held its third annual assembly this year in collaboration with the Tuscaloosa Medical Society, at the Tuscaloosa Country Club of that city, on October 12. Presiding at the various sessions were Dr. A. M. Walker of Tuscaloosa; Dr. J. O. Morgan of Gadsden; Dr. H. E. Simon of Birmingham, and Dr. Gilbert Douglas, Chairman of the Board of Regents of the United States Chapter, who occupied the chair at the banquet. The speaker of the evening was Senator Lister Hill of Alabama. Dr. Max Thorek of Chicago, introduced by Dr. J. M. Galalee, President of the University of Alabama, spoke on the International College of Surgeons and its significance in the world today.

Southern Surgical Section: Dr. B. T. Beasley, Atlanta, Managing Editor of the *Southern Surgeon,* states that plans are proceeding for a meeting of the Southern Surgical Section of the College to be held at Atlanta, Jan. 12 and 13, 1951. This meeting is being directed by Dr. William P. Nicolson, Jr., Atlanta. Dr. Beasley is program chairman.

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Costa Rican Chapter: The Costa Rican Chapter of the International College of Surgeons held its Annual Meeting on June 21, at which time the following officers were elected:

President	Dr. Jorge Vega Rodríguez
Vice-President	Dr. José A. Coto Garbanzo
Secretary	Dr. José M. Ortiz Céspedes
Ass't. Secretary	Dr. Rafael A. Núñez Hernández
Treasurer	Dr. Enrique Aguilar Alfaro

German Chapter: Professor Dr. Alexander Lezius has been appointed Professor of Surgery and Head of the Department of Surgery of the University of Hamburg, as well as Surgeon-in-Chief of the University Hospital, Hamburg-Eppendorf.

Professor Lezius, who has hitherto held the position of Chief Surgeon of the City Hospital of Luebeck, Germany, is Secretary of the German Chapter of the International College of Surgeons.

Indian Chapter: The following members of the United States Chapter participated in the Assembly of the Indian Chapter, held in Bombay on September 29 and 30 and October 1:

Dr. Elmer J. Ball, "Thyroglossal Duct Cyst"; Dr. Arnold S. Chaimov (presented a paper by Dr. S. N. Cooper, Bombay, "Dacryo-cystorhinostomy"); Dr. Lemuel D. Smith, "Hip Fractures"; Dr. George B. Callahan, "Intraperitoneal Perforations"; Dr. A. L. Delaney (presented a paper by Dr. E. A. DeSa of Bombay, "Hydrocephalus—A New Operative Procedure").

Final Program

Fifteenth Assembly

of the

INTERNATIONAL COLLEGE OF SURGEONS

United States Chapter

CLEVELAND PUBLIC AUDITORIUM, CLEVELAND, OHIO

October 31-November 1-3 Inclusive, 1950

Tuesday, October 31, 1950

MORNING SESSION

Presiding: Lyon H. Appleby, M.D., F. R. C. S. (Eng.), F.R.C.S. (Can.), F.A.C.S., F.I.C.S., Vancouver, Canada

Secretary: Lloyd J. Netto, M.D., F.I.C.S., West Palm Beach, Florida

Gastric Symposium

9:00- 9:15 Patterson, John W., M.D.
Assistant Professor of Anatomy, Western Reserve University School of Medicine.
"Summary of the Surgical Anatomy of the Stomach"

9:15- 9:30 Selkurt, Ewald, M.D.
Associate Professor of Physiology, Western Reserve University School of Medicine.
"Summary of the Physiology of the Stomach"

9:30- 9:45 Reagan, James W., M.D.
Assistant Pathologist, Western Reserve University School of Medicine.
"Summary of the Surgical Pathologic Lesions of the Stomach"

9:45-10:00 Friedell, Hymer L., M.D.
Professor of Radiology, Western Reserve University School of Medicine.
"A Survey of Upper Gastrointestinal Tract Lesions as Found by X-Ray Examinations, with Special Reference to Early Gastric Cancer"

10:00-10:45 Intermission to View Exhibits

10:45-11:00 Sawyer, Kenneth C., M.D., F.A.C.S., F.I.C.S., Denver
Assistant Professor, University of Colorado Medical School and Tumor Clinic; Consultant, General Surgery, Fitzsimons General Hospital, Denver; Consultant, General Surgery, Veterans Hospital, Fort Logan.
"Personal Evaluation of Vagotomy in Treatment of Peptic Ulcer"

11:00-11:15 Nissen, Rudolph, M.D., F.I.C.S., New York
Assistant Professor, Clinical Surgery, Long Island College of Medicine; Attending Surgeon, Brooklyn Jewish Hospital.
"Atypical Gastroduodenal Resections for Peptic Ulcer"

11:15-11:30 Wise, Robert A., M.D., F.A.C.S., Portland, Oregon
Assistant Clinical Professor of Surgery, University of Oregon Medical School; Chief, Surgical Service, Veterans Hospital, Portland.
"Gastric Polyps—Discrete and Diffuse"

11:30-11:45 Connolly, Earl A., M.D., F.A.C.S., F.I.C.S., Omaha
Associate Professor of Surgery, Creighton University School of Medicine; Attending Surgeon, St. Joseph's, Doctors, St. Catherines and Childrens Hospitals.
"Bleeding Peptic Ulcer"

11:45-12:00 Meyer, Karl A., M.D., F.A.C.S., F.I.C.S., Chicago
Professor of Surgery, Northwestern University Medical School; Chairman, Department of Surgery, Cook County Hospital.
and
Stein, Irving F., Jr., M.D., Chicago
Clinical Assistant in Surgery, Northwestern University Medical School; Research Associate, Hektoen Institute for Medical Research.
"Recurrent Peptic Ulcer Following Surgery—Diagnostic and Therapeutic Problems"

12:00-12:15 Babington, Suren H., M.D., F.I.C.S., Berkeley, California
Chief of Surgery, Herrick Memorial Hospital, Berkeley.
"Pre- and Postoperative Care in Gastric Surgery"

Tuesday, October 31, 1950

AFTERNOON SESSION

Presiding: Moses Behrend, M.D., F.A.C.S., F.I.C.S., Philadelphia

Secretary: Ralph E. Scovell, M.D., F.I.C.S., San Francisco

2:00- 2:20 Baumgartner, Conrad J., M.D., F.A.C.S., F.I.C.S., Beverly Hills, California
Associate Professor of Surgery, College of Medical Evangelists, Los Angeles; Senior Surgeon, Los Angeles County General Hospital.
"Lateral Cysts and Fistulas of the Neck"

2:20- 2:40 **Sauer, Dean, M.D., F.A.C.S.,** St. Louis

Senior Instructor in Surgery, St. Louis University School of Medicine; Attending Surgeon, St. Louis City and St. Louis County Hospitals, St. Louis.

"Multiple Visceral Resections"

2:40- 3:00 **Thorlakson, Paul H. T., M.D., M.R.C.S. (Eng.), F.R.C.S. (C), F.A.C.S.,** Winnipeg, Canada

Associate Professor of Surgery, University of Manitoba; Director and Chief of Surgery, Winnipeg Clinic.

"Multiple Primary Foci of Carcinoma of the Colon"

3:00- 3:20 **Puestow, Charles B., M.D., F.A.C.S.,** Chicago

Chief, Surgical Service, Veterans Administration Hospital, Hines, Illinois; Senior Surgeon, Illinois Research and Educational Hospitals, Henrotin Hospital, Chicago.

"Causes of Postcholecystectomy Syndrome"

3:20- 3:40 **Curtis, George M., M.D., F.A.C.S., F.I.C.S. (Hon.),** Columbus, Ohio

Professor of Surgery, Ohio State University Medical School; Chief, Research Surgical Service, University Hospital.

"The Indications for Splenectomy"

3:40- 4:10 **Intermission to View Exhibits**

4:10- 4:30 **Monteiro, Alfredo, M.D., F.A.C.S., F.I.C.S. (Hon.),** Rio de Janeiro, Brazil

4:30- 4:50 **Witte, Dexter H., M.D., F.A.C.S., F.I.C.S.,** Milwaukee

Former Associate Clinical Professor of Surgery, Marquette University Medical School.

"Carcinoma of the Cervical Stump"

EVENING SESSION

8:00- 9:00 **Panel Discussion with Morning Speakers**

Moderator: Claude J. Hunt, M.D., F.A.C.S., F.I.C.S., Kansas City, Missouri

9:00-10:00 **Panel Discussion with Afternoon Speakers**

Moderator: Herbert Acuff, M.D., F.A.C.S., F.I.C.S., Knoxville, Tennessee

Wednesday, November 1, 1950

MORNING SESSION

Presiding: Gordon S. Fahrni, M.D., F.R.C.S. (Can.), F.A.C.S., F.I.C.S. (Hon.), Winnipeg, Canada

Secretary: Lindon Seed, M.D., F.I.C.S., Chicago, Illinois

Thyroid Symposium

9:00- 9:15 **Francis, Carl C., MD.**

Assistant Professor of Anatomy, Western Reserve University School of Medicine.

"Summary of the Surgical Anatomy of the Thyroid Gland"

9:15- 9:30 **Shipley, Reginald, M.D.**

Associate Professor of Medicine, Western Reserve University School of Medicine.

"Summary of the Physiology of the Thyroid Gland"

9:30- 9:45 **Graham, Allen, M.D., F.A.C.S.,** Pittsburgh

Associate Professor, Departments of Surgery and Pathology, Western Reserve University School of Medicine; Surgical Pathologist, Cleveland Clinic Foundation; Pathologist, Western Pennsylvania Hospital, Pittsburgh.

"Criteria of Thyroid Malignancy"

9:45-10:00 **Davison, T. C., M.D., F.A.C.S., F.I.C.S. (Hon.),** Atlanta

President, American Goiter Association; Chief, Surgical Service of Georgia Baptist Hospital; Surgical Consultant, Sheffield Cancer Clinic.

and

Letton, A. H., M.D., F.A.C.S., F.I.C.S., Atlanta

"Thyroiditis"

10:00-10:45 **Intermission to View Exhibits**

10:45-11:00 **Bartels, Elmer C., M.D., F.A.C.P.,** Boston

Department of Internal Medicine, Lahey Clinic, Boston.

"The Proper Pre-operative Use of Anti-Thyroid Drugs"

11:00-11:15 **Cattell, Richard B., M.D., F.A.C.S.,** Boston

Surgeon-in-Chief, New England Deaconess Hospital.

"Technic of Thyroidectomy"

11:15-11:30 **Lundy, John S., M.D., F.I.C.S. (Hon.),** Rochester, Minnesota

Chief, Section on Anesthesiology, Mayo Clinic; Professor of Anesthesiology, The Mayo Foundation for Medical Education and Research.

"The Problem of the Thyroid Gland from the Standpoint of the Anesthesiologist"

11:30-11:45 **Crile, George, Jr., M.D., F.A.C.S.,** Cleveland

Surgeon, Cleveland Clinic.

"The Present Status of the Treatment of Hyperthyroidism"

11:45-12:00 **Rawson, Rulon W., M.D.,** New York

Chief, Department of Clinical Investigation, Sloan-Kettering Institute; Associate Professor of Medicine, Cornell University Medical School; Attending Physician, Memorial Hospital, New York.

"Radioactive Iodine: Its Use in the Study and Treatment of Thyroid Neoplasms"

12:00-12:15 **Bartlett, Robert, W., M.D., F.A.C.S.,** St. Louis

Assistant Professor of Clinical Surgery, Washington University School of Medicine.

"Pitfalls in the Management of Nodular Goiter"

AFTERNOON SESSION

Presiding: Philip Thorek, M.D., F.A.C.S., F.I.C.S., Chicago

2:00- 2:20 **Wilkinson, R. J., M.D., F.A.C.S., F.I.C.S.,** Huntington, West Virginia

"Trichobezoar"

2:20- 2:40 **McGraw, Arthur B., M.D., F.A.C.S.,** Detroit

Senior Associate Surgeon, Henry Ford Hospital, Detroit.

"Surgical Aspects of Meckel's Diverticulum"

2:40- 3:00 McGuire, Louis D., F.A.C.S., F.I.C.S., Omaha

Associate Professor of Surgery, Creighton University School of Medicine; Assistant Attending Surgeon, Creighton Memorial and St. Joseph's Hospitals.

"Surgical Management of Acute Cholecystitis"

3:00- 3:20 Babcock, Wayne W., M.D., LL.D., F.A.C.S., F.I.C.S., Philadelphia

Emeritus Professor of Surgery, Temple University Medical School.

"Possible Fallacies in Biliary Surgery"

3:20- 3:40 Nelson, M. Russell, M.D., F.A.C.S., F.I.C.S., New York

Assistant Clinical Professor, Gynecology and Obstetrics, New York Medical School and Flower Fifth Avenue Hospital.

"Obstetrical Bleeding"

3:40- 4:10 Intermission to View Exhibits

4:10- 4:30 Moon, Louis E., M.D., F.A.C.S., F.I.C.S., Omaha

Associate Professor of Surgery and Head of Department of Proctology, Creighton University School of Medicine.

"A Discussion of Anal, Rectal and Sigmoid Lesions Commonly Seen"

4:30- 4:50 Best, R. Russell, M.D., F.A.C.S., Omaha

Professor of Surgery, University of Nebraska College of Medicine, Omaha.

"Factors Related to Avoiding the Colostomy in Lesions of the Rectosigmoid"

EVENING SESSION

8:00- 9:00 Panel Discussion with Morning Speakers

Moderator: Arnold S. Jackson, M.D., F.A.C.S., F.I.C.S., Madison, Wisconsin

9:00-10:00 Panel Discussion with Afternoon Speakers

Moderator: Harry E. Bacon, M.D., F.A.C.S., F.I.C.S., Philadelphia

Thursday November 2, 1950

MORNING SESSION

Presiding: Rudolph Nissen, M.D., F.I.C.S., New York

Secretary: Paul F. Doege, M.D., F.A.C.S., F.I.C.S., Marshfield, Wisconsin

9:00- 9:20 O'Neill, J. Norman, M.D., F.A.C.S. Los Angeles

Instructor in Surgery, University of Southern California Medical School; Attending Surgeon, Los Angeles County General Hospital.

"A Critical Analysis of Fifty Diaphragmatic Hiatus Hernias Repaired by the Abdominal or Transthoracic Approach"

9:20- 9:40 Beck, Claude S., M.D., F.A.C.S., Cleveland

Professor of Neurosurgery, Western Reserve University Medical School; Chief Consultant, Neurosurgery, Crile Veterans Hospital; Visiting Neurosurgeon, Cleveland City Hospital; Associate Surgeon, University Hospitals, Cleveland.

"The Surgical Treatment of Coronary Disease"

9:40-10:00 Thorek, Max, LLD., D.Sc., M.D., F.I.C.S., F.B.C.S., Chicago

Professor of Surgery, Cook County Graduate School of Medicine; Founder and Secretary General, International College of Surgeons; Formerly Attending Surgeon, Cook County Hospital; Surgeon-in-Chief, American Hospital; Consulting Surgeon, Municipal Tuberculosis Sanitarium.

"Impending Death Under Anesthesia"

10:00-10:30 Intermission to View Exhibits

10:30-10:50 Ward, Grant E., M.D., D.Sc., F.A.C.S., Baltimore

Associate Professor of Surgery, Johns Hopkins University School of Medicine; Associate Professor of Surgery, University of Maryland School of Medicine; Associate Professor of Oral Surgery and Special Lecturer, School of Dentistry, University of Maryland; Visiting Surgeon, Johns Hopkins Hospital; Surgeon-in-Charge, Tumor Clinic, Johns Hopkins Hospital and University of Maryland Hospital.

and

Hendrick, James W., M.D., F.R.C.S., F.I.C.S., San Antonio, Texas

"Tumors of the Jaws"

10:50-11:10 Kinsella, Thomas J., M.D., F.A.C.S., Minneapolis

Clinical Professor of Surgery, University of Minnesota Medical School; Senior Consultant in Thoracic Surgery, U. S. Veterans Bureau Facility, Fort Snelling.

"Some Simple Thoracic Emergencies"

11:10-11:30 Zieman, Stephen A., M.D., F.A.C.S., F.I.C.S., Mobile, Alabama

"Re-establishing Lymph Drainage in Lymphedema of the Extremities"

11:30-11:50 Stuck, Ralph, M.D., F.I.C.S., Denver

Assistant in Neurosurgery, University of Colorado Medical School; Neurosurgeon, St. Joseph, St. Anthony, Mercy, Presbyterian, St. Luke's, Rose Memorial, Denver General and Colorado General Hospitals, Denver.

"Subdural Hematoma in Infants" (Motion Picture)

AFTERNOON SESSION

Presiding: William C. MacCarty, Sr., M.D., F.A.C.S., F.I.C.S. (Hon.), Rochester, Minnesota

Secretary: George C. Shivers, M.D., F.A.C.S., F.I.C.S. Colorado Springs

2:00- 2:20 Harrington, Stuart W., M.D., F.A.C.S., Rochester, Minnesota

Chief, Section of Thoracic and General Surgery, Mayo Clinic; Professor of Surgery, University of Minnesota, Mayo Foundation, Rochester.

"Surgical Treatment of Bilateral Carcinoma of the Breast"

2:20- 2:40 Nicolson, William P., Jr., M.D., F.A.C.S., F.I.C.S., Atlanta

"Human Proof of Animal Experiment as One of the Causes of Cancer of the Breast"

2:40- 3:00 **Munro, Donald, M.D., F.A.C.S.,** Boston

Surgeon-in-Chief, Department of Neurosurgery, Boston City Hospital; Assistant Professor of Neurosurgery, Harvard Medical School; Associate Professor of Neurosurgery, Boston University Medical School.

"Herniation of the Temporal Cortex through the Incisura Tentorii"

3:00- 3:20 **Marks, Mark M., M.D., F.I.C.S.,** Kansas City, Missouri

Chief, Section on Proctology, Department of Surgery at Menorah Hospital and Alfred Benjamin Dispensary.

"Barium Modification with Methocel in the Diagnosis of Bowel Lesions"

3:20- 3:40 **Douglas, Gilbert F., M.D., F.A.C.S., F.I.C.S.,** Birmingham, Alabama

Associate Professor of Gynecology, Medical College of Alabama; Chairman of the Board of Regents, United States Chapter, International College of Surgeons.

"Ectopic Pregnancy"

3:40- 4:10 **Intermission to View Exhibits**

4:10- 4:30 **Acuff, Herbert, M.D., F.A.C.S., F.I.C.S.,** Knoxville, Tennessee

Chief of Staff, St. Mary's Memorial Hospital; President-Elect, International College of Surgeons.

"Surgical Management of Conditions and Diseases Affecting the Liver"

4:30- 4:50 **Thiessen, Norman W., M.D., F.A.C.S.,** Cleveland

Chief of Surgery, Lakewood City Hospital; Clinical Instructor in Surgery and Anatomy, Western Reserve University Medical School; Consultant in Surgery, Crile Veterans Administration Hospital.

"The Education of the Biliary Surgeon"

Thursday Evening

Banquet

Grand Ballroom, Statler Hotel, Cleveland
7:30 P.M.

Custis Lee Hall, M.D., F.A.C.S., F.I.C.S., Washington, D. C., *Presiding*

Clinical Professor of Surgery, George Washington Medical School; Chief, Department of Orthopedics, Doctors Hospital; Consultant in Orthopedic Surgery, Naval Medical Center.

SPEAKER:
Frank Lahey, M.D., F.A.C.S., Boston
"Some of the Recent Advances in Surgery"

Friday, November 3, 1950

MORNING SESSION

Presiding: William R. Lovelace, M.D., F.I.C.S., Albuquerque, New Mexico
Secretary: George Ferre, M.D., F.I.C.S., Miami, Florida

9:00- 9:20 **Hendrick, James W., M.D., F.R.C.S., F.I.C.S.,** San Antonio, Texas
and
Ward, Grant E., M.D., F.A.C.S., Baltimore

Associate Professor of Surgery, The Johns Hopkins Hospital.

"Treatment of Carcinoma of the Lip"

9:20- 9:40 **Scott, Michael, M.D., F.A.C.S., F.I.C.S.,** Philadelphia

Associate Professor of Neurosurgery and Chief of Department, Temple University Hospital and Medical School; Attending Neurosurgeon, Jewish Hospital. The Philadelphia General Hospital and St. Christophers Hospital for Children.

and
Wycis, Henry T., M.D., F.A.C.S., Philadelphia

Assistant Professor of Neurosurgery, Temple University Hospital and Medical School.

"Stainless Steel Cranioplasty"

9:40-10:00 **Wright, Herbert B., M.D., F.A.C.S.,** Cleveland

Chief of Surgery, St. Vincent's Hospital, Cleveland; Chief of Urology, Deaconess Hospital; President, Cleveland Academy of Medicine.

"Ureteral Abnormalities as Related to General Surgery"

10:00-10:40 **Intermission to View Exhibits**

10:40-11:00 **Bendandi, Giuseppe, M.D., F.I.C.S.,** Rome, Italy

Associate Professor of Surgery, Surgical Clinic, University of Rome.

"Modern View of the Surgical Therapy of Pulmonary Echinococcus Cyst"

11:00-11:20 **Cruthirds, Archie E., M.D., F.A.C.S., F.I.C.S.,** Phoenix, Arizona

"A New Approach to the Healing of Burns by the Use of Sulfhydryl"

11:20-11:40 **Jackson, James A., M.D., F.A.C.S.,** Madison, Wisconsin

Chief of Staff, Methodist Hospital, and Co-Chief, Jackson Clinic.

and
Steeper, John R., M.D., Madison, Wisconsin

"Operative Excision of Giant Panniculus Adiposus" (Motion Picture)

11:40-12:00 **Fahrni, Gordon S., M.D., Ch.M., F.R.C.S. (C), F.A.C.S., F.I.C.S. (Hon.),** Winnipeg, Canada

Assistant Professor of Surgery, University of Manitoba Medical School; Assistant Surgeon, Winnipeg General Hospital; Honorary Attending Surgeon, King George and King Edward Hospitals.

"Factors Predisposing to Minimal Reaction to Surgical Operations"

AFTERNOON SESSION

Presiding: Gilbert F. Douglas, M.D., F.A.C.S., F.I.C.S., Birmingham, Alabama
Secretary: J. Harry Hayes, M.D., F.A.C.S., F.I.C.S., Little Rock

2:00- 2:20 **Fay, Temple, M.D., F.A.C.S., F.I.C.S.,** Philadelphia

Professor of Neurosurgery, Women's Medical College of Pennsylvania; Chief, Neurosurgery, Neurophysical Rehabilitation Clinic; Active Consulting Neurosurgeon, Philadelphia General Hospital.

"The Treatment of High Cervical Lesion Complicated by Bulbar Paralysis"

2:20- 2:40 Jackson, Dudley, Sr., D.V.M., M.D., F.A.C.S., San Antonio
Associate Professor of Surgery, Baylor Post-Graduate Medical School.
"A Study of Breast Secretion for the Detection of Intramammary Pathology and the Detection of the Silent Papilloma"

2:40- 3:10 Intermission to View Exhibits

3:10- 3:30 Stein, Justin J., M.D., F.A.C.S., F.I.C.S., Los Angeles
Assistant Clinical Professor of Surgery, College of Medical Evangelists, Los Angeles; Tumor Surgeon, Los Angeles Tumor Institute.
"Treatment of Breast Cancer: Surgery and Irradiation Therapy Discussed in Detail with Five-Year Results in a Large Series of Cases"

3:30- 3:50 Shelden, C. Hunter, M.D., M.S., F.A.C.S., Pasadena, California
Neurosurgeon, Huntington Memorial Hospital, Pasadena; Neurosurgeon, St. Vincent's Hospital, Los Angeles.
"Surgical Management of Intracranial Arteriovenous Aneurysms"

3:50- 4:10 Behrend, Moses, M.D., F.A.C.S., F.I.C.S., Philadelphia
Consulting Surgeon to Jewish and Mount Sinai Hospitals; Thoracic Surgeon to St. Agnes Hospital; Associate in Surgery, Jefferson Medical College.
and
Behrend, Albert, M.D., F.A.C.S., F.I.C.S., Waldo, Irving, M.D., Brylawski, Michael, M.D., Philadelphia
"Thrombocytopenia Purpura; Report of 53 Cases"

4:10- 4:30 Montenegro, Benedicto, M.D., F.A.C.S., Sao Paulo, Brazil
"Surgery of Peptic Ulcer"

4:30- 4:50 Cutler, Max, M.D., F.I.C.S., Chicago
Director, Chicago Tumor Institute.
"The Problem of 'Bleeding Nipple' "

Friday Evening

Convocation

Music Hall, Cleveland Public Auditorium

Custis Lee Hall, M.D., F.A.C.S., F.I.C.S., *Presiding*
Francis D. Wolfe, M.D., F.A.C.S., F.I.C.S., *Convocation Chairman*
Ernest F. Purcell, M.D., F.I.C.S., *Director of Pageant*
Claire E. Carr, M.D., F.I.C.S., *Director of Music*
Frank H. Murray, M.D., F.A.C.S., F.I.C.S., *Registration of Inductees*

Installation of Officers and Induction of New Fellows and Associate Fellows

Elmer L. Henderson, M.D., F.A.C.S., F.I.C.S. (Hon.)
President, American Medical Association.

"The Importance of International Cooperation in Surgery."

Urology Section

Public Auditorium, Club Room C

Wednesday, November 1, 1950

Presiding: George H. Ewell, M.D., F.I.C.S., Madison, Wisconsin
Secretary: Cyril K. Church, M.D., F.I.C.S., New York

9:00- 9:30 Thompson, Gershom J., M.D., F.A.C.S., F.I.C.S. (Hon.), Rochester, Minnesota
Professor of Urology, Mayo Foundation; Head of Section on Urology, Mayo Clinic.
and
Counsellor, Virgil S., M.D., F.A.C.S., Rochester, Minnesota
Professor of Surgery, Minnesota Graduate School.
"Uretovaginal Fistula"

9:30-10:00 Slotkin, George E., M.D., F.A.C.S., Buffalo, New York
Associate Professor of Urology, University of Buffalo Medical School, Chief of Service, E. J. Meyer Memorial Hospital and Millard Fillmore Hospital.
"Urinary Tuberculosis: Present Non-Surgical Treatment"

10:00-10:30 Lowsley, Oswald S., M.D., F.A.C.S., F.I.C.S., New York
President and Director, Oswald Swinney Lowsley Foundation, Inc., St. Clare's Hospital; Consulting Urologist to the Medical Corps, United States Navy.
"Crossed Ectopic Testis"

10:30-11:15 Intermission to View Exhibits

11:15-11:45 Brodny, M. Leopold, M.D., F.A.C.S., F.I.C.S., Boston
Assistant Professor, Radiology, Tufts College Medical School.
"Etiology of Strictures After Prostatic Surgery"

11:45-12:15 Carruthers, C.M., M.D., F.R.C.S. (Eng.), F.R.C.S., (Can.), F.A.C.S., F.I.C.S., Sarnia, Ontario, Canada
"Retropubic Prostatectomy"

Orthopedic Section

Public Auditorium, Club Room C

Wednesday, November 1, 1950

Presiding: Henry W. Meyerding, M.D., F.A.C.S., F.I.C.S., Rochester, Minnesota
Secretary: Eugene L. Jewett, M.D., F.A.C.S., F.I.C.S., Orlando, Florida

2:00- 2:20 Virgin, Herbert W., Jr., M.D., F.A.C.S., F.I.C.S., Miami, Florida
Chief, Orthopedic Surgery, Mt. Sinai Hospital; Orthopedic Surgeon, St. Francis Hospital, Miami Beach; Doctors' Hospital and Variety Children's Hospital, Coral Gables.
"Clinical Review of Four Hundred Knee Injuries"

2:30- 3:00 Garceau, George J., M.D., F.I.C.S., Indianapolis

Professor of Orthopedic Surgery, Indiana University Medical School.

and

Sigmund, Harvey, M.D.,
Indianapolis

"Impacted Fractures of the Anatomical Neck of the Femur"

3:00- 3:30 **McBride, Earl D., M.D., F.A.C.S., F.I.C.S.,** Oklahoma City, Oklahoma

Clinical Professor, Orthopedic Surgery, Oklahoma University School of Medicine; Chief Surgeon, Bone and Joint Hospital, and McBride Clinic, Oklahoma City.

"A Metallic Femoral Head Prosthesis for the Hip Joint"

3:30- 4:00 **Intermission to View Exhibits**

4:00- 4:30 **Lewin, Philip, M.D., F.A.C.S., F.I.C.S.,** Chicago

Professor, Bone and Joint Surgery, Northwestern Medical School; Professor, Orthopedic Surgery, Cook County Graduate School of Medicine.

"Low Back Pain and the Disk Syndromes"

4:30- 5:00 **Street, Dana M., M.D.,**
Memphis, Tennessee

Chief, Orthopedic Section, Kennedy Veterans Administration Hospital, Memphis.

"Medullary Nailing in Femur Shortening for Equalization of Leg Length"

Eye, Ear, Nose and Throat Section

All Section Meetings will be held in the Cleveland Public Auditorium, Club Room A

Wednesday, November 1, 1950

MORNING SESSION—OPHTHAMOLOGY

Presiding: Richard A. Perritt, M.D., F.A.C.S., F.I.C.S., Chicago, Illinois

Secretary: Paul C. Craig, M.D., F.A.C.S., F.I.C.S., Reading, Pennsylvania

10:00-10:30 **Harvey E. Thorpe, M.D.**
Pittsburgh

Chief, Department of Ophthalmology, Montefiore Hospital.

"Scleral Resection for the Treatment of Retinal Separation"

10:40-11:10 **John S. McGavic, M.D.,**
Bryn Mawr, Pennsylvania

Associate Professor of Ophthalmology, Temple University.

"Complications in Cataract Surgery"

11:10-11:20 **Intermission to View Exhibits**

11:20-12:20 **William A. Mann, M.D.,**
Chicago

Professor of Ophthalmology, Northwestern University Medical School.

"Care of the Aphakic Patient" (Slides)

12:30 **Luncheon**

Presiding: Richard A. Perritt, M.D., F.A.C.S., F.I.C.S., Chicago

Round Table Discussion:
"Care of the Aphakic Patient"

Participants:
William A. Mann, M.D., Chicago,
Oscar B. Nugent, M.D., F.A.C.S., F.I.C.S., Chicago
Otis B. Wolfe, M.D., Marshalltown, Iowa
David J. Edwards, M.D., Chicago

"Optician's Viewpoint"

AFTERNOON SESSION—OTOLARYNGOLOGY

Presiding: Chevalier L. Jackson, M.D., F.A.C.S., F.I.C.S., Philadelphia

Secretary: Matthew S. Ersner, M.D., F.A.C.S., F.I.C.S., Philadelphia

2:00- 2:20 **George B. Trible, M.D., F.A.C.S., F.I.C.S.,** Washington, D. C.

"Present Conceptions of Non-suppurative Labyrinthitis"

2:30- 2:50 **Samuel F. Kelley, M.D., F.A.C.S., F.I.C.S.,** New York

"Otorhinologic Surgical Problems in the Biochemical Era"

3:00- 3:20 **Juan Manuel Tato, M.D.,**
Buenos Aires, Argentina

"Surgical Treatment of Chronic Frontal Sinusitis"

3:30- 3:50 **Gerson Lowenthal, M.D., F.I.C.S.,**
Cincinnati, Ohio

Instructor in Otolaryngology, University of Cincinnati.

"Fractures of the Face"

3:50- 4:30 **Intermission to View Exhibits**

Thursday, November 2, 1950

MORNING SESSION—OPHTHALMOLOGY

Presiding: Clarence Albaugh, M.D., F.I.C.S., Los Angeles

10:00-10:30 **Richard A. Perritt, M.D., F.A.C.S., F.I.C.S.,** Chicago

"Technique of Complete Superficial Keratectomy"

(Preliminary remarks and 16 mm. Kodachrome film)

10:30-11:30 **Study Club: "Tropia Problems"**

Moderator: Paul C. Craig, M.D., F.A.C.S., F.I.C.S., Reading, Pennsylvania

Edmund B. Spaeth, M.D., F.A.C.S., F.I.C.S.

Professor at Ophthalmology Graduate School, University of Pennsylvania, Philadelphia; Attending Surgeon, Will's Eye Hospital.

11:30-12:30 **Business Meeting**

Presiding: Chevalier L. Jackson, M.D., F.A.C.S., F.I.C.S., Philadelphia

12:30 **Luncheon**

Presiding: Chevalier L. Jackson, M.D., F.A.C.S., F.I.C.S., Philadelphia

Speaker: **John E. L. Keyes, M.D., F.A.C.S.,** Cleveland

"Some of the Causes of Failure in Glaucoma Surgery"

AFTERNOON SESSION—OTORHINOLARYNGOLOGY

Presiding: Matthew S. Ersner, M.D., F.A.C.S., F.I.C.S., Philadelphia

2:00- 2:20 **Bernard J. Ronis, M.D., F.I.C.S.,** Philadelphia
Assistant Professor of Otorhinology, Temple University School of Medicine.
"Present Day Indications and Contraindications for Fenestration Operation for Otosclerosis"
(Motion Picture Demonstration)

2:30- 2:50 **John V. Blady, M.D., F.I.C.S.,** Bryn Mawr, Pennsylvania
Associate Professor of Surgery (Oncology) Temple University School of Medicine.
"Carcinoma of the Nose and Paranasal Sinuses"

3:00- 3:20 **Raymond S. Rosedale, M.D., F.I.C.S.,** Canton, Ohio
Senior Staff, Mercy and Little Flower Hospitals.
"Bronchoscopy in the Newborn—The Otolaryngologists' Contribution to Obstetrics"

3:30- 3:50 **E. Markey Pullen, M.D., F.I.C.S.,** New York
Attending Otolaryngologist, St. Clare's Hospital.
"The Submucous Resection"

3:50- 4:30 **Intermission to View Exhibits**

Assembly Information

• **Hotel Reservations**—See back cover.
• **Registration,** Monday 2:00 p.m. through Friday, 3:00 p.m., October 30-November 3, Cleveland Public Auditorium, Cleveland, Ohio.

Advance registration (on Monday) will save your time.

• **Admission by badge only** to all scientific Assemblies, section meetings, and to the exhibits. Present your I. C. of S. membership card to expedite registration. Registration fee, $5.00.

Bona fide doctors of medicine serving as residents and interns, if vouched for by written card or letter by the superintendent of their hospital or by an officer of the College, will be registered as guests. Please present credentials at Registration Desk.

• **Information of practical value** in every-day surgical practice will be obtained at the 1950 International College of Surgeons Assembly.

• **Papers Will Begin and End on Time.**

• **Banquet**—Grand Ballroom, Statler Hotel, Cleveland, Thursday, November 2. The social highpoint of the Assembly.

• **Convocation**—Friday, November 3, in Music Hall of Cleveland Public Auditorium. A colorful pageant symbolizing the international aspects of the College. Tickets available at Registration Desk for I. C. of S. members, all registrants, their families and guests (no admission fee).

• **One hundred twenty-seven technical exhibits** will open daily at 8:30 a.m. and close at 5:30 p.m. Frequent intermissions to view the exhibits have been arranged before, during and after the assemblies.

Please Register at Every Booth

Scientific Motion Picture Program

Philip Thorek, M.D., F.I.C.S., F.A.C.S., Chairman

Tuesday, Wednesday, Thursday and Friday

October 31, November 1, 2 and 3, 1950

The motion picture theater will be in continuous operation from 10:00 a.m. to 12 noon and 2:00 p.m. to 5:00 p.m. Tuesday through Friday. Each film will be shown twice during this period on a definite schedule. Films have been grouped according to subject matter.

Head Section

Tuesday and Thursday, 10:00 a.m.

Corneal Transplant

Charles I. Thomas, Western Reserve University School of Medicine, Cleveland

This film shows the surgical technic of a partial, penetrating corneal transplant. using the round graft technic. Silent; 22 minutes.

Tuesday and Thursday, 10:22 a.m.

Subdural Hematoma in Infants

Ralph M. Stuck, University of Colorado School of Medicine, Denver

The clinical picture of subdural hematoma in infants is explained. The diagnosis is confirmed by aspiration of the fontanelles. The lesion is treated surgically by complete removal of the cystic subdural membrane. Silent; 17 minutes.

Tuesday and Thursday, 10:39 a.m.

Transorbital Lobotomy

Walter Freeman, George Washington University School of Medicine, Washington, D. C.

Transorbital lobotomy is a modification of the recognized technic for prefrontal lobotomy. This new procedure is accomplished by approaching the frontal radiations via the roof of the eye socket. A bilateral operation employing electroshock anesthesia is shown in full detail. Sound; 12 minutes.

Neck Section

Tuesday and Thursday, 10:51 a.m.

Excision of Branchial Fistula and Cyst

Conrad J. Baumgartner, College of Medical Evangelists, Los Angeles

The operation for the removal of a branchial fistula, using a stepladder incision and carrying dissection to the lateral wall of the pharynx is depicted. This operation is followed by another for the excision of a branchial cyst. A horizontal incision is made through the skin and the cyst is excised through a further incision. Silent: 22 minutes.

Tuesday and Thursday, 11:13 a.m.

Subtotal Thyroidectomy

James R. Johnson, Los Angeles County Harbor General Hospital, Los Angeles

The essential steps in performing a subtotal thyroidectomy are shown on a patient with a large adenomatous goiter. Division of the pretracheal muscles, identification of the parathyroid glands, all of the thyroid vessels, and the recurrent laryngeal nerve are demonstrated. Silent; 12 minutes.

Heart Surgery

Tuesday and Thursday, 11:25 a.m.

Defibrillation of the Heart

Claude S. Beck, Western Reserve University School of Medicine, Cleveland

The value of this procedure as an emergency measure is discussed. The defibrillating machine and its use are demonstrated. Postoperative results are depicted and discussed. Silent; 11 minutes.

Tuesday and Thursday, 11:36 a.m.

Surgical Treatment for Patent Ductus Arteriosus

George H. Humphreys II, College of Physicians and Surgeons, New York

A 3½-year-old girl with a patent ductus arteriosus is examined, and the effects of the condition are demonstrated. The typical "coffee-mill" murmur is heard on the

sound track, and the roentgenogram shows the characteristic changes in the outline of the heart. The surgical approach is made through the anterolateral chest wall at the level of the second interspace. The anatomy of the region around the ductus is demonstrated. The ductus is ligated at each end, doubly clamped and divided. Postoperative views amplify the film. Sound; 13 minutes.

Cancer Series

Tuesday and Thursday, 1:00 p.m.

Films to be introduced by Dr. Brewster S. Miller, Assistant Director, Professional Education Section, American Cancer Society, Inc.

Gastrointestinal Cancer

American Cancer Society, Inc., New York, and National Cancer Institute, United States Public Health Service, Bethesda, Maryland.

This is the third in a series of teaching films dealing with the problem of the early diagnosis of carcinoma. Its importance can be stressed by the fact that gastrointestinal carcinoma accounts for one-fourth of all cancer cases and causes more than one-half of all cancer deaths. Diagnostic methods and criteria are shown in detail. Sound; 30 minutes.

Tuesday and Thursday, 1:45 p.m.

Self-Examination of the Breast

American Cancer Society, Inc., New York, and National Cancer Institute, United States Public Health Service, Bethesda, Maryland.

The film shows how the woman can be taught the simple technic of breast self-examination, by which method she, herself, may discover a tumor frequently as small as half an inch in diameter. It also teaches her the urgency of reporting any breast lump immediately to her physician. Sound; 15 minutes.

Thoracic Surgery

Tuesday and Thursday, 2:00 p.m.

Esophagogastrostomy for Achalasia of the Esophagus

John L. Madden, Long Island College of Medicine, Brooklyn

This film depicts in detail the technic of lateral anastomosis between the esophagus and the fundus of the stomach, proximal to the obstruction at the cardia. Sound; 30 minutes.

Tuesday and Thursday, 2:30 p.m.

Management and Technic of Pulmonary Lobectomy

Department of the Army, Office of the Surgeon General, Washington, D. C.

The case of a 28-year-old man who has clinical manifestations and bronchogram confirmations of bronchiectasis of the left lower lobe of the lungs. A detailed presentation is given of the extirpation of the diseased lung tissue which offered the only cure. Sound; 27 minutes.

Tuesday and Thursday, 2:57 p.m.

Transthoracic Repair of a Diaphragmatic Hiatus Hernia

J. Norman O'Neill, University of Southern California School of Medicine, Los Angeles

This film demonstrates the technic of removing fascia lata and its utilization in insuring permanency of the repair. The regional anatomy and surgical technic are depicted. Silent; 12 minutes.

Tuesday and Thursday, 3:09 p.m.

Pulmonary Arteriovenous Fistula

Albert Behrend, Temple University School of Medicine, Philadelphia

This film depicts the symptoms and signs as well as the roentgen findings in a pulmonary arteriovenous fistula. Lobectomies performed on both left and right sides are demonstrated. Silent; 19 minutes.

Abdominal Surgery

Tuesday and Thursday, 3:28 p.m.

Subtotal Gastrectomy

Philip Thorek, University of Illinois College of Medicine, Chicago

A subtotal gastric resection with closure of the duodenal end and a retrocolic end to side gastrojejunostomy is presented. The operation is performed for a prepyloric carcinoma of the stomach. The surgical steps are shown in detail and the surgical anatomy is stressed. The film is amplified by colored illustrations, roentgenograms and microphotography. Silent; 45 minutes.

Tuesday and Thursday, 4:13 p.m.

Surgery of the Biliary Tract

Arnold Jackson, Jackson Clinic, Madison, Wisconsin

The technic employed in performing surgery of the biliary tract is demonstrated. A cholecystectomy is depicted as well as the technic used in removing common duct stones and the use of the T tube. Silent; 12 minutes.

Tuesday and Thursday, 4:25 p.m.

Intrahepatic Cholangiojejunostomy with Partial Hepatectomy for Biliary Obstruction

Kenneth C. Sawyer, University of Colorado School of Medicine, Denver

The film demonstrates a method of treating extensive obstruction of the common hepatic duct by anastomosing one of the intrahepatic biliary ducts to the jejunum following partial resection of the left lobe of the liver. Silent; 18 minutes.

Wednesday and Friday, 10:00 a.m.

Splenectomy for Splenomegaly

Raymond McNealy, Northwestern University Medical School, Chicago

This film shows the approach and technic of splenectomy utilizing a left subcostal incision. The method of delivering the spleen and demonstration of an accessory spleen are depicted. Silent; 12 minutes.

Wednesday and Friday, 10:12 a.m.

The Surgical Treatment of Hirschsprung's Disease

Robert B. Hiatt, Columbia-Presbyterian Medical Center, New York

A brief explanation of the syndrome by diagram and roentgenogram is followed by the operation. First, through an abdominal incision the peritoneum is opened, and the lower achalasic portion of the sigmoid is mobilized. A clamp is then inserted into the rectum from below, closed around a knuckle of the intestine and the rectum everted. After the abdomen is closed, the everted rectum and achalasic portion of sigmoid are excised, and the mucosa of the remaining sigmoid sutured to that of the anus. The sphincter mechanism remains intact, and bowel movements return to normal postoperatively. Sound; 17 minutes.

Gynecology

Wednesday and Friday, 10:29 a.m.

Technic of Vaginal Hysterectomy

Virgil S. Counseller, Mayo Clinic, Rochester, Minnesota

The technic shown in the film is applicable in all conditions requiring vaginal hysterectomy. Vaginal plastic repair is done following the removal of the uterus when repair is indicated. Silent; 18 minutes.

Wednesday and Friday, 10:47 a.m.

Total Abdominal Hysterectomy

Deward O. Ferris, Mayo Clinic, Rochester, Minnesota

The pathologic condition in this case is a large cervical fibroid necessitating wider dissection than is usually necessary for total hysterectomy. The film clearly shows the safeguards used in protecting the bladder and ureters during the complete operation. It also depicts the reconstruction of the pelvic fasciae and ligaments. Silent; 19 minutes.

Genitourinary Surgery

Wednesday and Friday, 11:06 a.m.

Transperitoneal Nephrectomy (Transverse Abdominal Incision)

Charles M. Stewart, University of Southern California School of Medicine, Los Angeles

The film demonstrates the use of the transverse abdominal incision for transperitoneal removal of large renal masses. Approaching the renal fossa from the front gives unlimited working space with the patient lying on his back. This approach gives excellent results when visual exposure of the renal pedicle is necessary. Silent; 16 minutes.

Wednesday and Friday, 11.22 a.m.

Subdiaphragmatic Renal Exposure by Eleventh Rib Resection

Henry Bodner, College of Medical Evangelists, Los Angeles

Renal exposure by removal of the eleventh rib and then a stepdown continuation of the incision along the upper border of the twelfth rib allows excellent exposure of the very large kidneys. The incision is made slightly more anterior than the usual subcostal. The adrenals and spleen are also readily exposed by this route. This exposure also allows the renal pedicle to be approached directly. Silent, 12 minutes.

Wednesday and Friday, 11:34 a.m.

Tumor of the Testicle

James C. Sargent, Marquette University School of Medicine, Milwaukee

This film presents several major clinical types of testicular tumors with comment on those most malignant and least radiosensitive, for which radical regional gland dissection seems indicated. The operation of orchiectomy with radical gland dissection is shown. Sound; 21 minutes.

Proctology

Wednesday and Friday, 2:00 p.m.

Transcolonic Removal of Benign Adenomatous Polyp

Harry E. Bacon, Temple University School of Medicine, Philadelphia

The film shows the technic of transcolonic removal of benign adenomatous polyps based on 56 cases. The methods of diagnosis and the technic of sigmoidotomy are depicted. Silent; 12 minutes.

Wednesday and Friday, 2:12 p.m.

Proctoplasty in Hemorrhoidectomy

A. Gerson Carmel, University of Cincinnati College of Medicine, Cincinnati

The removal of large segments of hemorrhoidal tissues, while frequently necessary, is prone to be followed by stenosis and seepage. These sequelae are preventable by employing plastic procedures which include whole thickness sliding grafts and the suturing of partially detached cut skin edges to the superior portion of the muscular anorectal ring and mucous membrane. Silent; 13 minutes.

Vascular Surgery

Wednesday and Friday, 2:25 p.m.

Arteriovenous Fistula with False Sac—Lower Femoral Vessels

(Quadruple Ligation and Excision)

Department of the Army, Office of the Surgeon General, Washington, D. C.

The essential phases of diagnosis and the best conditions under which the preoperative studies may be accomplished are demonstrated and portrayed. Details of surgical procedure and reasons therefore are shown. Sound; 16 minutes.

Wednesday and Friday, 2:41 p.m.

Varicose Veins, Using a New Type of Stripper

Earl A. Connolly, Creighton University School of Medicine, Omaha

The anatomy and technic of the "vein stripping" operation is shown. The armamentarium is presented in detail. Postoperative results are evaluated, and illustrations amplify the discussion. Silent; 29 minutes.

Wednesday and Friday, 3:10 p.m.

Thrombosis and Embolism

Norman P. Schenker, Cantonal Hospital, Geneva, Switzerland

This film presents the subject of thromboembolism, utilizing microphotography. The formation of a thrombus as well as its detachment are clearly demonstrated. English narration clearly describes the interesting story of clot formation and embolus migration. Sound; 20 minutes.

Orthopedics

Wednesday and Friday, 3:30 p.m.

Cineplastic Operation

Department of the Army, Office of the Surgeon General, Washington, D. C.

Shows a cineplastic operation. Cords are attached to muscle and then to a prosthetic appliance so that the patient can operate the prosthetic appliance by contracting his own muscles in the amputation stub. Sound; 16 minutes.

Wednesday and Friday, 3:46 p.m.

The Bone Bank

Philip D. Wilson, Hospital for Special Surgery, New York

This film is designed to illustrate how a bone bank for refrigerated, homogenous bone is organized and employed. The usual sites from which bone is obtained for this purpose, and the method of storing it in a deep-freeze unit, are shown. Typical orthopedic operations in which it is used are briefly illustrated. Roentgenograms and microscopic studies based on experimental data show how well such bone is assimilated into the body. The many advantages to an orthopedic service or hospital of using such refrigerated homogenous bone are summarized. Sound; 28 minutes.

Wednesday and Friday, 4:14 p.m.

Surgical Approaches to the Scapulohumeral Joint

Leroy C. Abbott, Veterans Administration and University of California School of Medicine, San Francisco

The film shows the anatomy of the scapulohumeral joint with animation. Surgical approaches for repair in recurrent dislocation, arthrodesis of the shoulder and the removal of deposits are presented. Sound; 30 minutes.

Television Program
Fifteenth Annual Assembly, United States Chapter

General Chairman: T. S. Gerspacher, M.D., F.A.C.S., F.I.C.S.
Co-Chairman: Carl Rotter, M.D., F.I.C.S.
Clarence W. Engler, F.A.C.S., Chief of Staff
Herbert Wright, M.D., F.A.C.S., Director of Surgery
Donald Darrah, M.D., F.A.C.S., Coordinator and Chairman of Television Program

At its Fifteenth Annual Assembly the International College of Surgeons will present a three-day program of surgical operations in color television. The program will be sponsored and directed by the Smith, Kline and French Laboratories through the courtesy and cooperation of the staff of St. Vincent Charity Hospital, Cleveland. Specific arrangements will be handled by the Television Committee of the International Congress. The program will be transmitted from 9 a.m. to 10 p.m. on November 1, 2 and 3.

Special color television receivers will be installed in the Cleveland Public Auditorium, enabling up to 1,000 surgeons to watch the operations simultaneously with their actual performance at St. Vincent Charity Hospital. Each surgeon will broadcast a commentary by means of a small microphone in his mask.

November 1

1. *Dr. Earle B. Kay, Institute of Thoracic Surgery, Western Reserve University; Visiting Thoracic Surgeon, City Hospital; Staff Associate, St. Vincent Charity Hospital*

   Transthoracic Repair
   Diaphragmatic Hernia

2. *Dr. H. H. Wyand, Head of Ophthalmologic Department, St. Vincent Charity Hospital*

   Combined Extracapsular Cataract
   Extracapsular Cataract

3. *Dr. Paul A. Milcarek, Visiting Surgeon, St. Vincent Charity Hospital*

   Surgery of Varicose Veins

4. *Dr. Clifford L. Kiehn, St. Vincent Charity Hospital*

   Plastic Surgery of Burns

5. *Dr. Frank Weinman, Visiting Proctologist, St. Vincent Charity Hospital*

   Hemorrhoidectomy

6. *Dr. O. E. Weber, Chief of Staff, Evangelical Deaconess Hospital; Visiting Surgeon, St. Vincent Charity Hospital*

   Cholecystectomy

7. *Dr. Herbert S. Wright, Director of Surgery, St. Vincent Charity Hospital; Chief Urologist, Evangelical Deaconess Hospital; Consulting Urologist, U.S. Army Air Force*

   Nephrectomy

November 2

1. *Dr. W. H. Odell, Assistant Visiting Surgeon, St. Vincent Charity Hospital*
   Open Reduction of Fracture of Femur
2. *Dr. Henry A. Zimmerman, Director of Cardiovascular Departments, City Hospital and St. Vincent Charity Hospital*
   Intracardiac Catheterization
3. *Dr. Spencer Braden, St. Vincent Charity Hospital*
   Removal of Herniated Intravertebral Disk
4. *Dr. Frank Vecchio, Junior Assistant Visiting Surgeon, St. Vincent Charity Hospital; Instructor in Anatomy, Western Reserve University*
   Thyroidectomy

November 3

1. *Dr. Donald Darrah, Clinical Instructor in Surgery, Western Reserve University; Associate Visiting Surgeon, Lakewood Hospital; Senior Assistant Visiting Surgeon, St. Vincent Charity Hospital*
   Inguinal Herniorrhaphy
2. *Dr. C. Glenn Barber, Senior Clinical Instructor, Western Reserve University; Orthopedic Surgeon, St. Vincent Charity Hospital*
   Synovectomy of Knee
3. *Dr. O. A. Weber, Chief of Staff, Evangelical Deaconess Hospital; Visiting Surgeon, St. Vincent Charity Hospital*
   Radical Breast Amputation
4. *Dr. H. H. Wyand, Head of the Ophthalmologic Department, St. Vincent Charity Hospital*
   Recession of the Internal Rectus Muscle of the Eye
   Combined Extracapsular Cataract
5. *Dr. Darrel T. Shaw, Clinical Instructor in Plastic Surgery, Western Reserve University; Consultant at Marine Hospital and Crile Veterans Hospital*
   Surgery of the Hand
6. *Dr. E. P. Neary, Assistant Professor of Clinical Surgery, Western Reserve University*
   Vaginal Hysterectomy
7. *Dr. Earle B. Kay, Institute of Thoracic Surgery, Western Reserve University; Visiting Thoracic Surgeon, City Hospital; Staff Associate, St. Vincent Charity Hospital*
   Transthoracic Gastrectomy
8. *Dr. Victor D. Ippolito, Junior Staff Member, St. Vincent Charity Hospital; Visiting Surgeon, Mary Mount Hospital*
   Total Hysterectomy
9. *Dr. E. P. Neary, Assistant Professor of Clinical Surgery, Western Reserve University*
   Gastric Resection

New Books

Intestinal Intubation. By Meyer O. Cantor. Springfield, Ill.: Charles C Thomas, Publisher, 1949. Publisher, 1949. Pp. 333, with 147 illustrations.

Intestinal intubation, that invaluable aid in the treatment of conditions involving distention of the bowel, is here explored in all its ramifications. Dr. Cantor has collected extensive historical, experimental and pragmatic data on the subject and has integrated it into a highly interesting presentation. The remarkable improvement in both tubes and technic during the decade just past is emphasized, as is the fact that a thorough knowledge of the method is essential to its effective use.

The book opens with a discussion of the history of the procedure and the invention of the various tubes and kindred devices. The anatomy of the gastrointestinal tract is reviewed, and the physiology of the intestine as related to intubation is discussed. The special problems associated with distention and decompression are examined. An entire chapter is devoted to description of the different tubes available, and another to the technic of their use.

Various intestinal conditions requiring intubation, such as ileus, are treated in some detail. Lesions of the colon occupy a separate chapter. There are chapters also on the nursing care of the patient and on intubation for infants and children, with the special technics and precautions advisable in such cases. An especially praiseworthy feature is a chapter on possible errors and the safeguards that may be set up and maintained against them.

Handbook of Surgery. By Eric C. Mekie and Ian Mackenzie. Baltimore: The Williams and Wilkins Company, 1949. 2d ed. Pp. 764, with 29 illustrations.

This is a compact but comprehensive book on general surgery, planned as a manual of immediate reference. As such it is admirably worked out, representing a substantial improvement over the first edition of seven years ago. No alteration has been made in the general intention, but new material has been added and old material revised to bring it up to date. The result is a book easy to consult and helpful to depend on in an emergency.

Mr. Mekie is Professor of Clinical Surgery at the King Edward VII College of Medicine at Singapore. Mr. Mackenzie is the First Assistant in the Department of Surgery at the University of Durham. They have based their work largely on teaching experience and a first-hand knowledge of what the student needs. Sir John Fraser, who contributes the foreword, says: "It is true that there are many surgical textbooks which fulfil the desiderata . . . but I believe that it" (*A Handbook of Surgery*) "will be a success. . . . I am impressed by the manner in which the subject is presented. The authors have avoided the pitfall of unnecessary detail and have brought out the essential and important aspects."

The book's range covers the entire field of general surgery. The illustrations, though comparatively few for a volume this length, are excellently chosen and well executed. A list of 267 pertinent references completes the work.

Advances in Surgery. Compiled and edited by the Editorial Board of Interscience Publishers. New York and London: Interscience Publishers, 1949. Vol. 2. Pp. 590, with approximately 50 illustrations.

The Editorial Board responsible for this up-to-date compendium is headed by Dr. William DeWitt Andrus as Chairman. The members of the Board are Hugh Cavins of Oxford, Edward D. Churchill of Boston, Clarence Crafoord of Stockholm, Lester R. Dragstedt of Chicago, Emile Holman of San Francisco, John S. Lockwood of New York, D. W. Gordon Murray of Toronto, Alton Ochsner of New Orleans and Isidor S. Ravdin of Philadelphia. Volume 2 covers the following main topics: pulmonary function in relation to thoracic surgery; surgery of the esophagus; the surgical treatment of hypertension; congenital anomalies of the heart and great vessels; craniocerebral injuries; the use of streptomycin; skin grafting; tumors of the peripheral nerves; tumors of the testis, and management of carcinoma of the pancreas and duodenum. All subjects are treated primarily from the point of view of recent additions to surgical knowledge and new developments in technic, with an evaluation of the results of various methods.

The contributing authors are all well known in their several fields. The chapter on pathologic aspects of peripheral nerve tumors, by Dr. N. Chandler Foot, is of particular interest and is well illustrated with photomicrographs, some in full color. Charts, graphs, line drawings and statistical tables implement the book throughout, providing a good source of quick reference for correlative study or writing. A sufficient but not excessive list of bibliographic references follows each chapter, providing an example of economy which many surgical writers would do well to follow. The work is adequately cross-indexed—another good point—and the illustrations, the majority of which are charts, graphs and line drawings, are so planned and distributed as to furnish optimum implementation.

The First Anesthetic. By Frank Kells Boland. Athens, Georgia: University of Georgia Press, 1950.

Perhaps a more satisfactory title for this book might be "The First Anesthetist" rather than "The First Anesthetic," since its chief concern is the identity of the man who first discovered and administered a surgical anesthetic. Asserting emphatically that the hero in this drama was the Georgia physician, Crawford W. Long, the author does what he can to eliminate the possibility of anyone else's tire tracks covering up Dr. Long's "footprints in the sands of time." Crawford Long, of course, emerges as the dominant figure, but at the outset anesthesia itself is the protagonist, the beginning chapters being devoted to a comprehensive survey of primitive sleep-inducing agents antedating the knowledge that alkaloids were the active principle in making soporific drugs soporific. Known methods of mitigating pain, including mesmerism and drugs taken by mouth, were not only lacking from a utilitarian point of view but were hampered by tradition and religious opposition.

Belief in the possibility of painless surgery had long existed, but its actual achievement was delayed until 1842, when ether was administered by Dr. Long while he removed a tumor from a patient's neck.

The young doctor apparently recognized the magnitude of his discovery, but his apprehension of the opinion of influential colleagues who still doubted the value of sleep-inducing drugs may have been responsible for his long delay in demanding recognition. There are both witnesses and documents, however, to substantiate his initial performance, and it was chiefly his own reserve and lack of initiative that gave precedence to later anesthetists. The predominant purpose of this work, therefore, is to refute the primary claims of Wells, Morton and Jackson. The author does not deny that Morton was the first public demonstrator of ether anesthesia, but he insists that Crawford Long should be recognized as its progenitor. He bases his conclusions on the fact that Morton admitted obtaining his knowledge of the safety and effectiveness of ether from Jackson, who had ample opportunity and a sufficiently acquisitive nature to lead him to appropriate Long's discovery. Numerous details are introduced to show that Jackson at the time was fired with the idea that posterity would owe him a boundless debt as the discoverer of anesthesia, while the practical Crawford Long had been utilizing the agent in at least five operations before it was so used by anyone else. Long had his constituents, including at one time the eminent Dr. Marion Sims, and they expounded his claims vehemently to any skeptics.

The book is well written; every possible proof is investigated, and profuse documentation is presented; but some of the facts are rendered inconclusive by preoccupation with detail. There will be controversy as long as there is doubt. In the last analysis this is not important. Since it is the work one considers and not the man, the real question with regard to anesthesia is not what has been done and who did it, but what further work can and will be done as a result.

The Urinary Function of the Kidney. By A. V. Wolf. New York: Grune & Stratton, Inc., 1950. Pp. 363, with 49 illustrations.

This is a physiologic study of renal function in relation to the urinary tract. It is thoroughly scientific in concept and presentation, opening with an exhaustive coverage of the subject of water balance and fluid transfer.

Dr. Wolf is an experienced investigator and teacher and has framed his work to meet the needs not only of the physiologist but of the clinician and the pharmacologist.

The book is lavishly supplied with charts, tables and diagrams, and, as is suitable to a presentation of this kind, includes a prodigious bibliography covering more than fifty pages. There is also a well organized index of pertinent cross references.

Among the topics of emphasis are renal physiology in general; hydration and dehydration; diuresis and diuretic preparations; the role of the endocrine glands in urinary function; and "body water compartments." The entire work of course, is highly technical and distinctly specialized; nevertheless it makes easier reading than might be expected, since the author writes well and clearly and wastes no words.

Le Insufficienze Acute Del Circolo Periferico—Lo Shock. By Luigi Imperati. Naples: Casa Editrice V. Idelson, 1950.

The story of shock has been written and rewritten many times. It is a topic for research with endless possibilities. The subject is so endless and the problems so great that any contribution of worth is welcomed. Prof. Imperati, Director of Surgical Pathology at Sassari University, has made an excellent contribution to the subject of shock.

Prof. Imperati has divided his work into nine chapters, the last of which concerns the treatment of shock. The most interesting paragraphs of this chapter treat of surgical problems in shock therapy. Among the subjects discussed are surgical resuscitation, cardiac massage, nerve block and the carotid sinus reflex.

The book is warmly recommended as a scientific work on shock.

Abstracts from Current Literature

Persistent Cervical Thymus Gland; Thymectomy. Arnhein, E. E., and Gemson, B. L.: Surgery 1950, **27**:603, 1950.

This is a report of a case in which the thymus gland caused tracheal obstruction in a boy 9 months old because it had not fully descended into the chest, the obstruction being caused by the connection between the cervical and thoracic portions of the thymus gland as it lay in the sternal notch. The mother had noted a mass low in the child's neck since he was 1 month old. Pathologically the specimen consisted of two well defined lobes joined at their proximal extremity, which gave the specimen a roughly triangular shape. Microscopically the sections were typical of the thymus gland. Thymectomy was performed through a low transverse cervical incision. The postoperative course was marked by a varying rise in temperature, as high as 103 F. four hours after the operation. There was considerable dyspnea. A roentgenogram of the chest showed left pneumothorax with 50 per cent collapse and herniation of the left pleural cavity into the mediastinum. Oxygen and antibiotic therapy brought the child through without further trouble. Follow-up eleven months later revealed no abnormality of the chest or the extremities. There was normal development of the epiphysial and carpal centers of ossification.

Anterior Sacral Meningocele. Sherman, R. M.; Caylor, H. D., and Long, L., Am. J. Surg. **79**:743, 1950.

At the Caylor-Nichol Clinic of Bluffton, Indiana, 3 cases of anterior sacral meningocele have been observed. The authors have collected data on 34 cases in addition.

An anterior sacral meningocele is a herniation of the caudal portion of the meninges and their contents through a defect in the anterior surface of the sacrum. The meningocele sac, filled with cerebrospinal fluid, produces a cystic mass between the rectum and the sacrum. The mass may encroach upon the rectum, interfere with the fecal stream and produce constipation of varying severity. Numbness, tingling and pain may be present if the anterior sacral rami are involved in or compressed by the sac.

Deformity of the sacrum was present in 68 per cent of the cases reported, and the roentgenographic appearance of the deformity is consistent enough to be considered characteristic. Other tumors (lipomas, hygromas, chordomas, gliomas and teratomas) are uncommon but must be considered in the differential diagnosis of a tumor mass in this area.

Analysis of the reported cases shows a high mortality associated with any form of surgical intervention. Meningitis accounted for 11 deaths in 26 cases in which the patients were subjected to a diagnostic or therapeutic surgical procedure.

In the authors' opinion, anterior sacral meningocele should be treated by "skillful neglect." A large meningocele discovered in the course of examination during pregnancy would warrant consideration of cesarean section. In 1 case reported by the author a cesarean section was performed because of fetal malposition. In another, a patient with a meningocele of similar size had a history of three vaginal deliveries without unusual difficulty.

H. J. Rosevear

An Evaluation of the Pelvic Exenteration Operation. Parson, L., and Bell, J. W., Cancer **3**:205, 1950.

This article discusses the concept of ultraradical operation as applied to cancer of the cervix as well as to other pelvic cancers. Despite the magnitude of the procedure, no vital structures other than the excretory apparatus are involved; and, although the problems of excretion are formidable, they are in no sense insurmountable.

In the majority of the cases in this series all other known forms of therapy had been tried without success and treatment abandoned. However, consideration must be given to the mental and emotional status of the patient before contemplating the exenteration operation.

In preoperative preparation, renal status and intestinal preparation are important, as is the status of the nitrogen and electrolyte balance.

For the most part, gas-oxygen-ether with intratracheal intubation has been the anesthesia of choice. It is difficult to standardize the operative technic because of the many and variable conditions encountered, especially those due to previous operation and irradiation. The lines of cleavage are not sharp, and nodes may be attached to large vessels, which may result in troublesome bleeding. With respect to management of the ureters, the authors report that patients seem to have a smoother convalescence after cutaneous ureterostomy than after ureterocolostomy.

Postoperative management is more or less routine, but particular emphasis is laid on the management of oliguria if it develops, fistulas, electrolyte balance, nitrogen balance, sepsis and the problems of colostomy and ureterostomy.

Twenty-nine such operations are reported, 24 of which were complete. In 3 patients the rectum

and in 2 the bladder was spared. Of the total number of patients, 16 are living and 13 are dead.

The authors report a 22 per cent recurrence rate, but when one considers that only patients for whom other methods of therapy had been exhausted were chosen it is not too discouraging. The fact that only 32 per cent had demonstrably cancerous nodes, despite the magnitude of the cervical lesions, encourages one to feel that perhaps a certain number of such patients may be permanently salvaged, provided surgeons are prepared to make a sufficiently vigorous attack upon the disease.

In conclusion, the authors state that the patient can not only survive the operation but resume normal life and appear to be happy in doing so. The time element, however, is insufficient to justify evaluation.

CHARLES C. ABBOTT

Brachial Plexus Lesions after Cholecystectomy. Kilch, L. G., Lancet **1**:103, 1950.

The changing trend of opinion as to the causative factors of postoperative brachial paralysis are discussed.

Preference appears to have been given to extraneous pressure on the nerves until the theory of traction damage was advanced by Gerdy. Kilch reviews the tests of Horsley (1899), who produced complete traction disruption of the plexus by dropping cadavers on their heads so as to cause violent lateral flexion of the head and depression of the shoulder.

Such factors as postfixation of the plexus, cervical ribs and hypertrophied scalene muscles are reviewed and commented upon.

An increased incidence of these lesions has been noted since the widespread use of curare was begun.

HARVEY E. BILLIG, JR.

Fatality after Abdominal Arteriography. Wagner, F. B., Jr., and Price, A. H. Surgery **27**:621 1950.

Wagner and Price describe a bizarre accident following an attempt at aortic arteriography. With a technic which they have used in 50 cases there was 1 fatality. This followed introduction of the needle into the aorta through a translumbar approach. The needle evidently entered the orifice of the superior mesenteric artery, and the patient died a few hours later, apparently of mesenteric thrombosis. Postmortem examination was not performed.

The solution injected was 80 per cent sodium iodide (10 cc.). The authors now recommend the use of a 30 per cent solution for adequate visualization of the site of introduction of the needle for the aortographic procedure. They express the opinion that injection of a less concentrated solution will not tend to cause arteriospasm or even damage of the intima.

M. T. FRIEDELL

The Female Urethra. Sicci, J. V.; Lisa, J. R., and Thom, C. H., Am. J. Surg. **79**:499, 1950.

The authors studied 21 urethras in the fetus, the newborn, the infant and the adult. In excision of the urethra all the surrounding soft parts, such as the anterior vaginal wall, the urethrovesical area and the lateral tissues extending to the periosteum, were included. With some of the fetal specimens the suprasymphysial abdominal wall and the bony structures were also included. The urethras were sectioned longitudinally and cross-sectioned serially. The stains used were routine hemotoxylin and eosin and special stains for accurate differentiation of connective, elastic and nerve tissues.

Histologically the urethra may be divided into three portions, namely, the upper, middle and lower thirds. The upper third is in reality a continuation of the bladder, as the musculature of the vesical wall forms that part of the urethra. The middle third is characterized by an outer layer of circular striated muscle and a well vascularized inner layer of fine involuntary muscle bundles. The lower third is characterized by a fibrous structure and is free of muscle of any type. The epithelium of the urethra is of the stratified squamous type and is attached to the underlying structures; this extends the entire length of the urethra. The substantia propria extends the entire length of the urethra. In the upper and middle thirds it is composed of fibrous connective tissue rich in fine elastic fibers and moderately rich in blood vessels. In the lower third it becomes extremely thick and is a mass of fibrous tissue.

Continuing their observations, the authors report the following negative observations: 1. There are no lymphatic glands in the urethra. 2. There is no intrinsic voluntary muscle sphincter. 3. There are no fascial sheets and no compartments pierced by the urethra.

CHARLES C. ABBOTT

Femoral Herniorraphy. Hughes, E. S. R., and Fathi, J. T., Lancet **1**:620-622, 1950.

Hughes and Fathi report good results with the inguinal operation for femoral hernia. They turn downward the inferior portion of the transversalis fascia to form a new septum for the femoral ring. The flap of fascia is united to Cooper's ligament by 3 silk sutures, which cause the flap to rotate without tension and completely close the femoral ring.

Reconstruction of the posterior wall of the inguinal canal is accomplished by suturing the upper flap of the transversalis fascia to the inguinal ligament at its junction with the lower edge of the former.

The removal of a large sac leaves a space at the saphenous ring. This may be partially obliterated by suturing the superficial fascia to the fascia lata. The operation is completed by overlapping the external oblique muscle anterior or posterior to the cord. In the absence of strangulation the neck of the sac is freed by blunt dissection. In the presence of strangulation the sac is opened and the bowel inspected before the neck of the sac is freed, so as to avoid the accidental reduction of strangulated bowel.

Excellent results have followed this operation. Thirty-one cases have been followed for two years or more. There has been no recurrence, either in the femoral region or in the inguinal incision.

LEIGH F. WATSON

Superfetation in Uterus Bicornis Unicollis: A Case Report. Mizell, V. D., J. Nat. Med. Assoc. 42:73, 1950.

Embryologically the uterus and the vagina are formed by the fusion of the two müllerian ducts. Union takes place from below upward. Failure of fusion anywhere between the extremities of the two canals can explain almost all forms of "uterus didelphys." Statistics indicate that double uterus is rare. It occurs about once in every 2,000 cases. In 1922 Miller reported 54 cases of double uterus pregnancies in a single horn. Schauffer reported 11 cases of the same type. Kehrer in 1900 reported that in 78 per cent of his series of 84 cases of uterus didelphys there were rudimentary horns.

Positive diagnosis may be made by an observant obstetrician early in pregnancy in about 20 per cent of cases of didelphys. The location of the round ligament is a good differential point in diagnosis. De Lee has stated that in most cases double uterus is discovered at the operating table.

The case reported is that of a primiparous Negro housewife aged 27, admitted to the hospital on Nov. 21, 1946, for delivery by cesarean section ten days prior to the expected date of labor. A diagnosis of contracted pelvis had been made a year before, when a stillborn infant was delivered by section after the patient had been in labor for eighteen hours. The birth was estimated to be three weeks overdue. Roentgen study confirmed the opinion that there was a disproportion between the pelvic outlet and the presenting part. A cesarean section was performed, and a normal eight and one-half months' baby was delivered. Attached to the left side of the uterus, from which the fetus was removed, was a horn. The fetus was removed by the Porro type of section. The left uterus was about the size of a grapefruit and had the appearance of gravid uterus of three months. The age of the fetus in left uterus was confirmed; one month later the patient aborted a four-month fetus.

In December 1947, thirteen months later, a pregnancy in the left uterus had progressed to term. A Porro section was performed at the request of the patient.

G. F. DOUGLAS

The Fate of the Foreskin. Gairdner, D., Brit. M. J., 2:1433, 1949.

None of the commonly advanced reasons for circumcision are convincing. During the first year or two of life, when the infant is incontinent, the prepuce fulfils as essential function in protecting the glans. The development of the prepuce is incomplete in the newborn male child, and separation from the glans, rendering it retractable, does not usually occur until some time between the ages of 9 months and 3 years. In the light of these facts a conservative attitude towards the prepuce is proposed, and a routine for its hygiene is suggested under which many circumcisions could and would be eliminated.

EDMUND LISSACK

Simple Excision of Lung Abscess. Holman, C. W., Surgery 27:546-550, 1950.

The author reports on 3 patients on whom local excision was performed for single chronic pulmonary abscess. Although the series is small, the success of this method indicates that it will be used in a greater number of cases.

The author presents five prerequisites for a successful local excision of a chronic pulmonary abscess:

1. A single abscess in which lobectomy would sacrifice too much normal lung tissue.
2. Infecting organisms sensitive to antibiotics.
3. A certain degree of chronicity of the abscess. (This is desirable, if not essential.)
4. A bronchial stump covered with either a pleural flap or a free pleural graft.
5. Expert anesthesia, careful dissection, adequate blood replacement and attentive postoperative care, with use of antibiotics as in other surgical procedures on the lungs.

There were no complications and no deaths among the 3 patients who underwent operation under these conditions.

M. O. CANTOR

Armamentarium

Therapeutic Drugs: Parke, Davis and Company of Detroit announce the availability of "Chloromycetin Kapseals" in a new package size. The preparation is said to be effective against a variety of virus, rickettsial and bacterial infections, notably typhoid, typhus, and undulant fevers; bacillary urinary infections; atypical pneumonia; Rocky Mountain spotted fever; lymphogranuloma venereum; herpes zoster (shingles), and whooping cough. It is now supplied in hermetically-sealed capsules containing 250 mg., in packages containing 16 capsules and in bottles of 100.

The same company presents "Penicillin S-R with Dihydrostreptomycin," a combination of soluble and repository types of penicillin together with dihydrostreptomycin, possessing substantially the same antibacterial properties as the parent drug and a somewhat lower toxicity. The contents of each rubber-diaphragm-capped drain-free vial, when diluted with 3.3 cc. of aqueous diluent, provides a single dose containing 300,000 units of crystalline procaine penicillin-G; 100,000 units of crystalline sodium penicillin-G; and 1.0 Gm. of dihydrostreptomycin (sulfate). The compound is recommended by the makers in treatment of infections due to gram-positive and gram-negative organisms. It is said to be particularly useful when mixed infections are involved, such as subacute bacterial endocarditis and infections of the urinary tract; also in the preparation and protection of surgical sites. Penicillin S-R with Dihydrostreptomycin is supplied in single-dose vials in individual cartons.

Recording Thermometer: A continuous record of actual temperatures in refrigeration is offered by the Minicorder, a self-contained recording thermometer developed by the Tagliabue Instruments Division of the Weston Electrical Instrument Corporation. According to the manufacturers, the minicorder requires no connection to any power supply, yet records temperatures over a period as long as seven days without attention. It is therefore suggested for the storage and refrigeration of medical supplies.

"Atomic Robot" for Diagnosis of Brain Tumor: Under the guidance of the doctors at Northwestern Medical School, an electronic device called the "Isotron" pinpoints brain tumors which have baffled even expert diagnosticians. With this atomic robot the doctors expect to prevent many unnecessary skull operations and speed the necessary ones by accurate location of tumor tissue.

The new technic, as developed by Dr. Loyal Davis and his associates Drs. Leroy, Cooper and Ashkenazy, with physicist Ted Fields, seems deceptively simple. Instead of the skull incisions formerly necessary in many cases, the procedure consists simply of giving the patient an injection of a radioactive isotope. This radioactive "tracer" accumulates in the tumor tissue and sends out "messages" which are received by the two Geiger counter arms of the Isotron. Readings are taken at 32 spots on the head. Within a few minutes the experts can determine definitely the existence and location of any possible tumor tissue.

The instrument was designed by the Nuclear Instrument and Chemical Corporation of Chicago. The drug used to carry the radioactive isotope is diiodofluorescein. This drug was specially formulated for the purpose by Abbott Laboratories of North Chicago, Illinois, and contains controlled amounts of radioactive iodine. Upon entering the blood stream, the formulation gradually concentrates in tumor tisse, and the Geiger counters of the Isotron detect it easily and precisely. If no tumor is present, a different reaction is obtained.

Antihistaminic Cream: Sharp & Dohme, Incorporated, announces the release of "Topaminic," a new antihistaminic, analgesic cream for prompt relief from acute itching due to atopic and contact dermatitis, as well as a variety of other allergic skin disorders. The cream is said to suppress the effects of histamine-like substances that may be released in the skin during allergic reactions and to arrest the uncontrollable desire to scratch, thus minimizing the secondary infections that sometimes occur in irritated, excoriated skin. Eczema, urticaria, angioneurotic edema and dermographia are among the conditions for which it is recommended.

Drug for Premenstrual Tension: Pyrabrom, a recently discovered compound, has been found effective in the treatment of premenstrual tension and motion sickness, according to a statement released by officials of the Brayten Pharmaceutical Company, who state that research has demonstrated the drug's effectiveness in minimizing premenstrual water retention and accompanying gain in weight. In a series of 57 controlled clinical cases the average gain in weight during the week prior to menstruation was 3.8 pounds (1.7 Kg.). When the same series of patients was given Pyrabrom medication, the gain was only 1.7 pounds (0.8 Kg.). Relief of subjective symptoms (breast soreness, fullness of ankles and breast, low back pain, headaches and general nervousness) is reported to be outstanding.

Pyrabrom will be dispensed only on a physician's prescription.

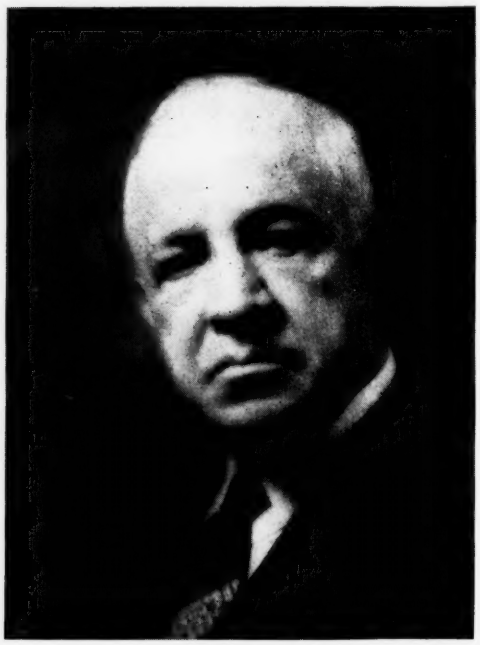
In Memoriam

DESIDERIO ROMÁN

M.D., F.A.C.S., F.I.C.S.

In the passing of Dr. Desiderio Román of Philadelphia the International College of Surgeons and the world at large have lost an active participant of impressive stature, a man whose outlook was genuinely universal and whose humanitarian impulses were unbounded. A Past President of both the United States Chapter and the International College, Dr. Román worked indefatigably to further the interests of surgical science on a world-wide basis.

Of a distinguished Nicaraguan family—he was a brother of the late Dr. Victor Román y Reyes, President of Nicaragua, and an uncle of the present chief executive, General Anastasio Somoza—Dr. Román, as a citizen of the United States, maintained throughout his long and fruitful career his original deep concern for Pan-American relations. National mourning has been ordered throughout Nicaragua.



Dr. Desiderio Román

Coming to the United States in 1889, Dr. Román studied at the New York University Medical School. He continued his training in Philadelphia at Hahnemann Medical College and Jefferson Medical College, receiving his doctor's degree from the latter in 1893. He completed his internship at Hahnemann Hospital, after which he studied abroad for a time. In 1909 began his long official association with Hahnemann Hospital, of which he became Senior Surgeon and Professor of Clinical Surgery. He was associated also with St. Luke's and Children's Medical Center from 1906 until the time of his death, serving as Surgeon-in-Chief and head of the Department of Surgery. It was in the latter institution that he died, at the age of eighty, ending a professional career of well-deserved eminence.

Dr. Román's friends will remember him no less as a true citizen of the world than as a famed surgeon and an honored and honorable man. He made and kept himself familiar with cultural centers all over the world. His postgraduate work at the Universities of Heidelberg, Berlin, Vienna, Prague, Berne, Paris and London contributed strongly to his cosmic interests, and he returned frequently to these cities to renew old acquaintance and refresh his spirit; for he was no recluse, but a man to whom friendship and collaboration meant much. He was twice president of the Philadelphia County Medical Society, once of the Philadelphia Chapter of the Pan-American Medical Association; a Founder and Fellow of the American Board of Surgery; a member of the Board of Governors of the American College of Surgeons; a member of the Pennsylvania Medical Society, and a Fellow of the American Medical Association. His presidency of the International College of Surgeons extended from 1943 to 1945.

Despite the fact that his life and usefulness were spared to what is generally considered a ripe age, Dr. Román's death must still be considered untimely. The world can ill do without such men today.

Dr. Román is survived in the United States by his wife and by a nephew of his own name, Dr. Desiderio Román of Philadelphia. The International College of Surgeons extends to all the bereaved its wholehearted sympathy and condolence in their loss.